This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

+ *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.

+ *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.

+ *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.

+ *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at `http://books.google.com/`

WIDENER
HN 7UTP 2

H. O. No. 154

MEDITERRANEAN PILOT

VOL. IV

1916

Digitized by Google

Harv 1159.16

Harvard College Library

FROM THE

UNITED STATES GOVERNMENT

Digitized by Google

Digitized by Google

Digitized by Google

Digitized by Google

Digitized by Google

H. O. No. 154

MEDITERRANEAN PILOT

VOLUME IV

FROM CAPE MATAPAN (GREECE) EASTWARD, THE MEDITERRANEAN ARCHIPELAGO, AND THE SOUTHERN SHORE OF THE MEDITERRANEAN SEA, EASTWARD OF RAS ASHDIR (LIBIA)

1916

US
PUBLISHED BY THE HYDROGRAPHIC OFFICE
UNDER THE AUTHORITY OF THE
SECRETARY OF THE NAVY

WASHINGTON
GOVERNMENT PRINTING OFFICE
1916

Digitized by Google

Nav 1159.16

Harvard College Library
De . 1, 1916
From the
United States Government.

Digitized by Google

H. O. No. 154.

A summary of the Notices to Mariners affecting this publication, published during the year 1916, will be sent free of expense upon the receipt of this coupon at the United States Hydrographic Office, Washington, D. C.

Name .....

Address .....

H. O. No. 154.

A summary of the Notices to Mariners affecting this publication, published during the year 1917, will be sent free of expense upon the receipt of this coupon at the United States Hydrographic Office, Washington, D. C.

Name .....

Address .....

H. O. No. 154.

A summary of the Notices to Mariners affecting this publication, published during the year 1918, will be sent free of expense upen the receipt of this coupon at the United States Hydrographic Office, Washington, D. C.

Name .....

Address .....

H. O. No. 154.

A summary of the Notices to Mariners affecting this publication, published during the year 1919, will be sent free of expense upon the receipt of this coupon at the United States Hydrographic Office, Washington, D. C.

Name .....

Address .....

Digitized by Google

Digitized by Google

H. O. No. 154.

A summary of the Notices to Mariners affecting this publication, published during the year 1920, will be sent free of expense upon the receipt of this coupon at the United States Hydrographic Office, Washington, D. C.

Name .....

Address .....

H. O. No. 154.

A summary of the Notices to Mariners affecting this publication, published during the year 1921, will be sent free of expense upon the receipt of this coupon at the United States Hydrographic Office, Washington, D. C.

Name .....

Address .....

H. O. No. 154.

A summary of the Notices to Mariners affecting this publication, published during the year 1922, will be sent free of expense upon the receipt of this coupon at the United States Hydrographic Office, Washington, D. C.

Name .....

Address .....

H. O. No. 154.

A summary of the Notices to Mariners affecting this publication, published during the year 1923, will be sent free of expense upon the receipt of this coupon at the United States Hydrographic Office, Washington, D. C.

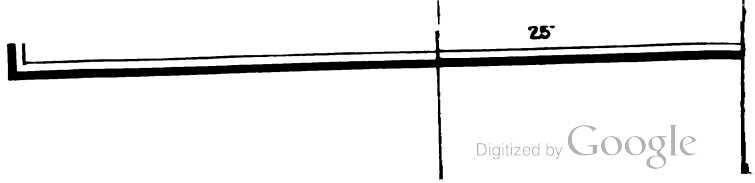
Name .....

Address .....

Digitized by Google

Digitized by Google

Digitized by Google



Digitized by Google

PREFACE.

This publication comprises the coast and islands of the Aegean Sea, the Mediterranean Archipelago, and, commencing on the southern shore of the Mediterranean Sea at Ras Ashdir, describes the coasts of Libia (Tripoli), Egypt, Karamania, Syria, and the island of Cyprus. The information contained in this publication has been compiled from all available sources, but principally from British Admiralty publications, Mediterranean Pilots Volumes IV and V, and has been corrected up to and including H. O. Notice to Mariners No. 32, 1916.

The bearings and courses are true and are given in degrees, from 0° (north) to 360° (clockwise).

Bearings limiting sectors of lights are toward the light.

The directions of winds refer to the points from which they blow; of currents, the points toward which they set. These directions are true.

Variations, with the annual rate of change, may be obtained from H. O. Chart No. 2406, Variation of the Compass.

Distances are expressed in nautical miles, the mile being approximately 2,000 yards.

Soundings are referred to low water. Ordinary springs.

Heights are referred to high water. Ordinary springs.

The latest information regarding lights, their characteristics, sectors, fog signals, and submarine bells should always be sought in the light lists.

Attention is invited to the coupons on the first page of this book, which entitle the purchaser to a summary of the Notices to Mariners affecting this publication. They will be ready for distribution as soon as practicable after the first of each year beginning January, 1917.

Mariners are requested to notify the United States Hydrographic Office, directly or through one of its branch offices, of any new information obtained, or of any errors or omissions discovered in this publication.

Digitized by Google

Digitized by Google

CONTENTS.

	Page.
Preface	3
Information relating to navigational aids and general navigation	9
Index	613
Index chart	faces. 3
Glossaries	7

CHAPTER I.

General remarks; trade; currency; communications; docks; coal; standard time; winds; climate; navigation of the archipelago; passages; currents; tides; buoys; signals; pilots and fishing vessels' lights 29

CHAPTER II.

The southeast coast of Greece from Cape Matapan to Spezzia Island, with the islands of Kithera and Antikithera 57

CHAPTER III.

East coast of Greece from Spezzia Island to Euripo Strait, including Doro Channel; with the adjacent islands, including Zea 89

CHAPTER IV.

The coast from Euripo Strait to Kara Su River, including the adjacent islands .. 141

CHAPTER V.

The Cyclades or westernmost of the southern islands of the archipelago 195

CHAPTER VI.

Coast of Asia Minor, from Cape Alupo to Samos Strait, with the southern Sporades Islands 241

CHAPTER VII.

The gulfs of Smyrna and Skala Nuova, including the islands of Psara, Khios, and Nikaria 305

CHAPTER VIII.

The coast from Cape Hydra or Aslam Burnu, Smyra Gulf, to Kara Su River, with the adjacent Sporades Islands 351

CHAPTER IX.

Island of Crete (Candia) 407

CHAPTER X.

Coasts of Libia (Tripoli) and Egypt—Ras Ashdir to El Arish 447

Digitized by Google

CHAPTER XI.

Page.
Coast of Karamania—Cape Alupo to Karadash Burnu..... 525

CHAPTER XII.

Cyprus—West and south coasts, Cape Arnauti to Cape Andreas; north coast, Cape Arnauti to Cape Andreas..... 555

CHAPTER XIII.

Coast of Syria—Karadash Burnu to El Arish..... 571

Appendix I.—Particulars of dry docks, patent slips, etc..... 611
II.—List of principal ports, showing particulars of depths, etc..... 612

Digitized by Google

GLOSSARIES OF WORDS OCCURRING IN THE CHARTS AND SAILING DIRECTIONS.

GREEK.

Greek.	English.	Greek.	English.
Agios, -a,-on, hagios, ayia, ayios.	Holy, sacred, saint.	Limne	Lake.
Akropolis	Citadel, fortress.	Lips	Southwest.
Akroterion	Cape.	Lithos	Stone.
Anemo	Wind.	Megale, megalo, megas	Great.
Apeliotes	East.	Melaine, melan, melas	Black.
Aspros, -a, -on	White.	Meses	Northeast.
Aster, astron	Star.	Metron	Measure.
Boreas, borras	North.	Mikros, -a, -on	Little.
Bounon	Mountain, hill.	Mulos	Mill.
Brachos	Cliff.	Naos	Church, temple.
Broma	Food.	Naulochos	Harbor.
Chersonesus	Peninsula.	Naus	Ship.
Chloros, -a, -on	Green.	Neos, -a, -on	New.
Chorion	Village.	Nesos, nisi, nisia	Islet, island, islands.
Chronos	Time.	Notos	South.
Croma	Color.	Oikos	House.
Dendron	Tree.	Ormos	Anchorage, bay, port.
Diorus	Canal.	Oros	Mountain, hill.
Drumos	Wood.	Palaios, -a, -on	Old.
Ekklesia	Church.	Petra	Rock.
Eruthros, -a, -on	Red.	Petros	Stone, rock.
Euros	Southeast.	Pharos	Lighthouse.
Glotta, glossa	Tongue.	Philos	Friend.
Gonia	Angle.	Phos, photos	Light.
Grapho	I write.	Pneuma	Wind.
Helios	Sun.	Polis	City, town.
Hudor	Water.	Potamos	River.
Isthmos	Isthmus.	Prasinos, -e, -on	Green.
Kastelli, kastro, kastron	Castle, fortress.	Prioreus, pilotes	Pilot.
Kato	Lower.	Purgos, pyrgos	Tower.
Khora	Small town.	Semanterion	Buoy, mark.
Kolpos	Gulf.	Skiron	Northwest.
Kome	Village.	Skopelos	Rock.
Kuklos	Circle.	Skopes	I see.
Limen	Harbor, port.	Taphos	Tomb.
		Zephuros, zephyros	West.

TURKISH.

Turkish.	English.	Turkish.	English.
Agatsh, aghach, aghaj	Tree.	Dil	Isthmus, point, sand-spit.
Agha	Eunuch, master, officer.	Dragoman	Interpreter.
Aghz	Entrance.	Duwar	Mole.
Ak	White.	Eski	Ancient, old.
Ada, adasi, ata	Island, islet, islands.	Fanar, fener	Lighthouse, beacon.
Bakshish	Gratuity.	Guel, gol, ghol	Lake.
Balchik	Clay.	Gharb, gharbi	West.
Bash	Chief, head.	Gyumruk	Customhouse.
Batagin	Marsh.	Ich, ichereh	Interior.
Bazar	Market.	Irmak	River.
Beyaz	White.	Isharet	Signal.
Boghaz	Channel, strait, estuary.	Iskele, iskelesi	Landing place.
Burnu, burun	Cape, point, promontory, headland.	Jami	Mosque.
Buyuk	Great.	Jel	Wind.
Capitan, captain	Commander of a vessel.	Jenub, jenubi	South.
Chai	River.	Kaba-kum	Gravel.
Chamur	Mud.	Kale, kaleh, kalesi	Castle.
Chiflik	Farm.	Kapu	Gate, pass.
Dahg, tagh	Mountain.	Kara	Black.
Demi yeri	Anchorage.	Karantina	Quarantine.
Deniz	Sea.	Kaya	Cliff, hill, rocky.
Deniz téli	Telegraph cable.	Kayalik	Rocky.
Dere	Valley.	Keurfaz	Gulf.
Derin	Deep.	Kahn	Inn, hotel.
Deyirmeni	Mill.	Kibla	South.
		Kilaguz	Pilot.
		Kilisa	Church.

Digitized by Google

Glossaries of words occurring in the charts and sailing directions—Continued.

TURKISH—Continued.

Turkish.	English.	Turkish.	English.
Kioi	Village.	Pussula	Compass.
Kirmzi, kizil	Red.	Reis	Captain of a vessel.
Konsolos	Consul.	Rusghar	Wind.
Koyun	Right, cove.	Sanjak	Flag, district.
Kuchuk	Small.	Saraï	Palace, house.
Kulleh	Tower.	Sedd	Mole.
Kum	Sand.	Selam	Salutation.
Kuyu	Well.	Shahbenderi	Buoy.
Kyupru	Bridge.	Shark	East.
Liman	Bay, harbor.	Shehr, sheher	Town, city.
Liman-reissi	Harbor master.	Shimal	North.
Liva	Country, flag.	Sighi	Bank, shoal.
Lodos	South or southwest wind.	Su, suyu	Water, river.
		Tabia, tabiet	Battery.
Maden	Mine.	Tash	Exterior.
Maghreb	West.	Tashlik	Stony.
Merdshan	Coral.	Tepe	Hill, tumulus.
Mesjid	Mosque.	Tersaneh	Turkish Admiralty.
Minare	Minaret.	Tus	Salt.
Mudir	Governor of a city.	Tutak	Bar of a river.
Nahr, nehir	River, stream.	Ufuk	Horizon.
Nishan	Beacon.	Vilayet	Province, district.
Orman	Forest, wood.	Yar	Hill, cliff.
Palanka	Fort, fortress.	Yeni	New.
Poiras	Northeast.	Yer	Land, country.
Posta	Post.		

ARABIC.

Arabic.	English.	Arabic.	English.
Ab, abu, bu	Father, chief.	Kalat, kelat, kulat	Castle.
Abiad, abyad	White.	Kantara	Bridge.
Abyar	Wells.	Karantina	Quarantine.
Adel, aleb	Sloping hill.	Kasba	Citadel.
Ahmar	Red (masculine).	Khan	Inn.
Ain	Fountain.	Kibli	South.
Akaba, acol	Wilderness.	Kothon	Port.
Akhal	Black.	Liman	Port.
Al	The.	Ma, moye	Water.
Anak	Cliff.	Maghreb	West.
Arish	Dune.	Marabut	Monument, tomb.
Asfal	Lower.	Marsa, mers, mersa, marza	Bay, cove, harbor.
Bab	Narrow strait, gate.	Masjed	Mosque.
Bahr	River, lake.	Matla	East.
Baida	Desert.	Medene	Minaret.
Balad	Town, village, land.	Mina	Harbor.
Bandera	Flag.	Mirjan	Coral.
Beheira, buhireh	Lake.	Nahr	River.
Beni	Tribe of Bedawin or other Arabs; mountains.	Nakhl	Palm tree.
		Natur	Tower.
		Nebi	Tomb, prophet.
Biar, bir	Wells, well.	Rais, reis	Captain of a vessel.
Bogaz	Entrance channel.	Rais el marsa	Captain of the port.
Bolis	Port police.	Ras	Cape, point.
Bosta	Post office.	Sabakat, sebkha	Salt lake.
Burj, buy	Castle, fort, tower.	Saghira, seghir	Small.
Bussla	Compass.	Sakije	Canal.
Duar	Arab encampment.	Sarayet Ras el Tin	Ras el Tin palace.
El	The.	Sarwe	Cypress.
Gera	Lake.	Sawahil	Coast guard.
Gharb	West.	Shab	Rocky shoal.
Gumruk	Customhouse.	Shark	East.
Gunsulato	Consulate.	Sherm	Cove.
Halat	Sandbank which dries.	Shmal	North.
Hamra	Red (feminine).	Sidi, sedi	Tomb.
Hassar, hissar	Rock.	Tel, tell	Hill.
Ingilyzy	British.	Tarf	Cape.
Jam, jamia	Mosque.	Tarsahana	Arsenal.
Jebel, jibel, gebel	Mountain, hill, island.	Tiligraf	Telegraph.
Jezirat	Island.	Umm	Mother.
Jun	Bay.	Wad, wadi, wed, uad	Valley, river bed, river.
Junub	South.	Welled	Tribe of Arabs.
Kabira, kebir	Large.	Zeitun	Olives.

Digitized by Google

INFORMATION RELATING TO NAVIGATIONAL AIDS AND GENERAL NAVIGATION.

THE CORRECTION OF CHARTS, LIGHT LISTS, AND SAILING DIRECTIONS.

The following publications are issued by the United States Hydrographic Office as guides to navigation: Charts, Chart Catalogues, Sailing Directions, Light Lists, Tide Tables, Notices to Mariners, Pilot Charts, and Hydrographic Bulletins. Of these, the Notices to Mariners and the Hydrographic Bulletins are free to mariners and others interested in shipping. The Pilot Charts are free to contributors of professional information, but are sold to the general public at 10 cents a copy. The other publications of the office are sold under the law at cost price.

The Charts, the Sailing Directions, and the Light Lists are all affected by continual changes and alterations, concerning which information from all parts of the world is published weekly in the Notices to Mariners.

The charts are always corrected for all available information up to the date of issue stamped upon them; and the Light Lists should be noted for the recent alterations and additions. The Sailing Directions, however, can not, from their nature, be so fully corrected, and in all cases where they differ from the charts, the charts must be taken as the guide.

Charts.—When issued from the Hydrographic Office, the charts have received all necessary corrections to date.

All small but important corrections that can be made by hand are given in the Notices to Mariners, and should at once be placed on the charts to which they refer.

Extensive corrections that can not be conveniently thus made are put upon the plates, and new copies are put on sale. Masters of vessels are urged to replace the old charts, which should be destroyed to prevent the possibility of their being used in the navigation of the ship.

The dates on which extensive corrections are made are noted on the chart on the right of the middle of the lower edge; those of the smaller corrections at the left lower corners.

The edition, and corresponding date, of the chart will be found in the right lower corner, outside the outer neat line.

Digitized by Google

In all cases of quotations of charts, these dates of corrections should be given, as well as the number of the chart (found in the lower right and upper left corners), in order that the edition of the chart referred to may be known.

The Light Lists are corrected before issue, and all changes are published in the weekly Notices to Mariners.

The navigating officer should make notations in the tabular form in the Light Lists and paste in at the appropriate places slips from the Notices to Mariners.

The Light Lists should always be consulted as to the details of a light, as the description in the sailing directions is not complete, and may be obsolete, in consequence of changes since publication.

The Sailing Directions or Pilots are kept corrected by addenda; and subsequent to date of last addenda, they should be kept corrected by means of the Notices to Mariners. Sailing Directions issued to naval vessels carry with them an envelope containing slips of corrections up to date of issue.

Addenda are published from time to time, and contain a summary of all the information received up to date since the publication of the volume to which they refer, canceling all previous Notices to Mariners.

To enable the books to be more conveniently corrected, addenda and Notices to Mariners are printed on one side only, and two copies of the latter are issued to each naval vessel, one to be cut and the slips pasted in at the appropriate places, the other to be retained intact for reference.

To paste in the slips, as the Notices to Mariners are received, is one of the duties of the navigating officer, demanding faithful attention.

It must, however, be understood that Sailing Directions will rarely be correct in all details, and that, as already stated, when differences exist, the chart, which should be corrected from the most recent information, should be taken as the guide, for which purpose, for ordinary navigation, it is sufficient.

The Tide Tables, which are published annually by the United States Coast and Geodetic Survey, give the predicted times and heights of the high and the low waters for every day in the year at 70 of the principal ports of the world, and, through the medium of these by means of tidal differences and ratios, at a very large number of subordinate ports. The tables for the Atlantic and the Pacific coast ports of the United States are also published separately.

It should be remembered that these tables aim to give the times of high and low water, and not the times of turning of the current or of slack water, which may be quite different.

Notices to Mariners, containing fresh information pertaining to all parts of the world, are published weekly and mailed to all

Digitized by Google

United States ships in commission, Branch Hydrographic offices and agencies, and United States consulates. Copies are furnished free by the main office or by any of the branch offices on application. With each Notice to naval vessels is sent also a separate sheet, giving the items relating to lights contained in the latest Notice, intended especially for use in correcting the Light Lists.

Pilot Charts of the North Atlantic, Central American Waters, and North Pacific and Indian Oceans are published each month, and of the South Atlantic and South Pacific Oceans each quarter. These charts give the average conditions of wind and weather, barometer, percentage of fog and gales, routes for steam and sailing vessels for the period of issue, ice and derelicts for the preceding period, ocean currents and magnetic variation for the current year, storm tracks for preceding years, and much other useful information. They are furnished free only in exchange for marine data or observations.

Hydrographic Bulletins, published weekly, are supplemental to the Pilot Charts, and contain the latest reports of obstructions and dangers along the coast and principal ocean routes, ice, derelicts, and wreckage, reports of the use of oil to calm the sea, and other information for mariners. They are to be had free upon application.

THE USE OF CHARTS.

Accuracy of chart.—The value of a chart must manifestly depend upon the character and accuracy of the survey on which it is based, and the larger the scale of the chart the more important do these become.

To judge of a survey, its source and date, which are generally given in the title, are a good guide. Besides the changes that may have taken place since the date of the survey, in waters where sand or mud prevails, the earlier surveys were mostly made under circumstances that precluded great accuracy of detail; until a chart founded on such a survey is tested, it should be regarded with caution. It may, indeed, be said that, except in well-frequented harbors and their approaches, no surveys yet made have been so thorough as to make it certain that all dangers have been found. The number of the soundings is another method of estimating the completeness of the survey, remembering, however, that the chart is not expected to show all the soundings that were obtained. When the soundings are sparse or unevenly distributed, it may be taken for granted that the survey was not in great detail.

Large or irregular blank spaces among soundings mean that no soundings were obtained in these spots. When the surrounding soundings are deep it may fairly be assumed that in the blanks the water is also deep; but when they are shallow, or it can be

Digitized by Google

seen from the rest of the chart that reefs or banks are present, such blanks should be regarded with suspicion. This is especially the case in coral regions and off rocky coasts, and it should be remembered that in waters where rocks abound it is always possible that a survey, however complete and detailed, may have failed to find every small patch or pinnacle rock.

A wide berth should therefore be given to every rocky shore or patch, and instead of considering a coast to be clear. the contrary should be assumed.

Fathom curves a caution.—Except in charts of harbors that have been surveyed in detail, the 5-fathom curve on most charts may be considered as a danger line or caution against unnecessarily approaching the shore or bank within that line, on account of the possible existence of undiscovered inequalities of the bottom, which only an elaborate detailed survey could reveal. In general surveys of coasts or of little frequented anchorages, the necessities of navigation do not demand the great expenditure of time required for so detailed a survey. It is not contemplated that ships will approach the shores in such localities without taking special precautions.

The 10-fathom curve on rocky shores is another warning, especially for ships of heavy draft.

A useful danger curve will be obtained by tracing out with a colored pencil, or ink, the line of depth next greater than the draft of the ship using the chart. For vessels drawing less than 18 feet the edge of the sanding serves as a well-marked danger line.

Charts on which no fathom curves are marked must especially be regarded with caution, as indicating that soundings were too scanty and the bottom too uneven to enable the curves to be drawn with accuracy.

Isolated soundings, shoaler than surrounding depths, should always be avoided, especially if ringed around, as it is doubtful how closely the spot may have been examined and whether the least depth has been found.

The chart on largest scale should always be used on account of its greater detail and the greater accuracy with which positions may be plotted on it.

Caution in using small-scale charts.—In approaching the land or dangerous banks, regard must always be had to the scale of the chart used. A small error in laying down a position means only yards on a large-scale chart, whereas on one of small scale the same amount of displacement means a large fraction of a mile.

Distortion of printed charts.—The paper on which charts are printed from engraved plates has to be damped. On drying distortion takes place from the inequalities of the paper, which greatly

Digitized by Google

varies with different papers and the amount of the damping; but it does not affect navigation. The larger the chart the greater the amount of this distortion. It must not, however, be expected that accurate series of angles taken to different points will always exactly agree when carefully plotted on the chart, especially if the lines to objects be long.

Mercator chart.—Observed bearings are not identical with those measured on the Mercator chart (excepting only the bearings north and south, and east and west on the equator) because the line of sight, except as affected by refraction, is a straight line and lies in the plane of the great circle, while the straight line on the chart (except the meridian line) represents, not the arc of a great circle, but the loxodromic curve, or rhumb line, which on the globe is a spiral approaching but never in theory reaching the pole, or, if the direction be east and west, a circle of latitude.

The difference is not appreciable with near objects, and in ordinary navigation may be neglected. But in high latitudes, when the objects are very distant and especially when lying near east or west, the bearings must be corrected for the convergence of the meridians in order to be accurately placed on the Mercator chart, which represents the meridians as parallel.

On the polyconic chart, since a straight line represents (within the limits of 15 or 20 degrees of longitude) the arc of a great circle or the shortest distance between two points, bearings of the chart are identical with observed bearings.

The mercator projection is unsuited to surveying, for which purpose the polyconic projection is used by the Hydrographic Office and the Coast and Geodetic Survey.

Notes on charts should always be read with care, as they may give important information that can not be graphically represented.

Buoys.—Too much reliance should not be placed on buoys always maintaining their exact positions. They should therefore be regarded as warnings, and not as infallible navigational marks, especially when in exposed places and in the wintertime; and a ship's position should always, when possible, be checked by bearings or angles of fixed objects on shore.

Gas buoys.—The lights shown by gas buoys can not be implicitly relied on; the light may be altogether extinguished, or, if periodic, the apparatus may get out of order.

Whistle and bell buoys are sounded only by the action of the sea; therefore, in calm weather, they are less effective or may not sound.

Lights.—All the distances given in the Light Lists and on the charts for the visibility of lights are calculated for a height of 15 feet for the observer's eye. The effect of a greater or less height

Digitized by Google

of eye can be ascertained by means of the table of distances of visibility due to height, published in the Light Lists.

The glare of a powerful light is often seen far beyond the limit of visibility of the actual rays of the light, but this must not be confounded with the true range. Refraction, too, may often cause a light to be seen farther than under ordinary circumstances.

When looking out for a light, the fact may be forgotten that aloft the range of vision is much increased. By noting a star immediately over the light a very correct bearing may be obtained from the standard compass when you lay down from aloft.

On first making a light from the bridge, by at once lowering the eye several feet and noting whether the light is made to dip, it may be determined whether the ship is on the circle of visibility corresponding with the usual height of the eye, or unexpectedly nearer the light.

The intrinsic power of a light should always be considered when expecting to make it in thick weather. A weak light is easily obscured by haze, and no dependence can be placed on its being seen.

The power of a light can be estimated by its candlepower or order, as stated in the Light Lists, and in some cases by noting how much its visibility in clear weather falls short of the range corresponding to its height. Thus, a light standing 200 feet above the sea and recorded as visible only 10 miles in clear weather, is manifestly of little brilliancy, as its height would permit it to be seen over 20 miles if of sufficient power.

Fog signals.—Sound is conveyed in a very capricious way through the atmosphere. Apart from the influence of the wind large areas of silence have been found in different directions and at different distances from the origin of sound, even in clear weather; therefore, too much confidence should not be felt as to hearing a fog signal. The apparatus, moreover, for sounding the signal often requires some time before it is in readiness to act. A fog often creeps imperceptibly toward the land, and may not be observed by the lighthouse keepers until upon them; a ship may have been for many hours in it, and approaching the land in confidence, depending on the signal, which is not sounded. When sound travels against the wind, it may be thrown upward; a man aloft might then hear it though inaudible on deck.

The submarine bell system of fog signals is much more reliable than systems transmitting sound through the air, as sound traveling in water is not subject to the same disturbing influences; the fallibility of the lighthouse keeper is, however, about the same in all systems, so that caution should be observed even by vessels equipped with submarine-bell receiving apparatus.

Digitized by Google

Submarine bells have an effective range of audibility greater than signals sounded in air, and a vessel equipped with receiving apparatus may determine the approximate bearing of the signal. These signals may be heard also on vessels not equipped with receiving apparatus by observers below the water line, but the bearing of the signal can not then be readily determined.

Vessels equipped with radio apparatus and submarine bell receivers may fix their distance from a light vessel having radio and submarine bell, utilizing the difference in velocity of sound waves of the radio and the bell. Sound travels 4,794 feet per second at 66° F. in water, and the travel of radio sound waves for practicable distances may be taken as instantaneous.

All vessels should observe the utmost caution in closing the land in fogs. The lead is the safest guide and should be faithfully used.

Tides.—A knowledge of the times of high and low water and of the amount of vertical rise and fall of the tide is of great importance in the case of vessels entering or leaving port, especially when the low water is less than or near their draft. Such knowledge is also useful at times to vessels running close along a coast, in enabling them to anticipate the effect of the tidal currents in setting them on or offshore. This is especially important in fog or thick weather.

The predicted times and heights of the high and low waters, or differences by which they may be readily obtained, are given in the Tide Tables for all the important ports of the world. The height at any intermediate time may be obtained by means of Tables 2A and 2B for most of the principal tidal stations of the United States, given in Table 1, and for the subordinate stations of Table 3 by using them as directed in the Tide Tables. The intermediate height may also be obtained by plotting the predicted times and heights of high and low water and connecting the points by a curve. Such knowledge is often useful in crossing a bar or shallow flats.

Planes of reference.[1]—The plane of reference for soundings on Hydrographic Office charts made from United States Government surveys and on Coast and Geodetic Survey charts of the Atlantic coast of the United States is mean low water; on the Pacific coast of the United States as far as the Strait of Juan Fuca, it is the mean of the lower low waters; and from Puget Sound to Alaska, the plane employed on Hydrographic Office charts is low water ordinary springs.

On most of the British Admiralty charts the plane of reference is the low water of ordinary springs; on French charts, the low water of equinoctial springs.

[1] The distinction between "rise" and "range" of the tide should be understood. The former expression refers to the height attained above the datum plane for soundings, differing with the different planes of reference; the latter, to the difference of level between successive high and low waters.

Digitized by Google

In the case of many charts compiled from old or various sources the plane of reference may be in doubt. In such cases, or when ever not stated on the chart, the assumption that the reference plane is low water ordinary springs gives a larger margin of safety than mean low water.

Whichever plane of reference may be used for a chart it must be remembered that there are times when the tide falls below it. Low water is lower than mean low water about half the time, and when a new or full moon occurs at perigee the low water is lower than the average low water of springs. At the equinoxes the spring range is also increased on the coasts of Europe, but in some other parts of the world, and especially in the Tropics, such periodic low tides may coincide more frequently with the solstices.

Wind or a high barometer may at times cause the water to fall below even a very low plane of reference.

On coasts where there is much diurnal inequality in the tides, the amount of rise and fall can not be depended upon and additional caution is necessary.

Mean sea level.—The important fact should be remembered that the depths at half tide are practically the same for all tides, whether neaps or springs. Half tide therefore corresponds with mean sea level. This makes a very exact plane of reference, easily found, to which it would be well to refer all high and low waters.

The Tide Tables give in Table 3, for all the ports, the plane of reference to which tidal heights are referred and its distance below mean sea level.

If called on to take special soundings for the chart at a place where there is no tidal bench mark, mean sea level should be found and the plane for reductions established at the proper distance below it, as ascertained by the Tide Tables, or by observations, or in some cases, if the time be short, by estimation, the data used being made a part of the record.

Tidal streams.—In navigating coasts where the tidal range is considerable, especial caution is necessary. It should be remembered that there are indrafts to all bays and bights, although the general run of the stream may be parallel with the shore.

The turn of the tidal stream offshore is seldom coincident with the times of high and low water on the shore. In some channels the tidal stream may overrun the turn of the vertical movement of the tide by three hours, forming what is usually known as tide and half tide, the effect of which is that at high and low water by the shore the stream is running at its greatest velocity.

The effect of the tidal wave in causing currents may be illustrated by two simple cases.

Digitized by Google

(1) Where there is a small tidal basin connected with the sea by a large opening.

(2) Where there is a large tidal basin connected with the sea by a small opening.

In the first case the velocity of the current in the opening will have its maximum value when the height of the tide within is changing most rapidly, i. e., at a time about midway between high and low water. The water in the basin keeps at approximately the same level as the water outside. The flood stream corresponds with the rising and the ebb with the falling of the tide.

In the second case the velocity of the current in the opening will have its maximum value when it is high water or low water without, for then there is the greatest head of water for producing motion. The flood stream begins about three hours after low water, and the ebb stream about three hours after high water, slack water thus occurring about midway between the tides.

Along most shores not much affected by bays, tidal rivers, etc., the current usually turns soon after high water and low water.

The swiftest current in straight portions of tidal rivers is usually in the middle of the stream, but in curved portions the most rapid current is toward the outer edge of the curve, and here the water will be deepest. The pilot rule for best water is to follow the ebb tide reaches.

Countercurrents and eddies may occur near the shores of straits, especially in bights and near points. A knowledge of them is useful in order that they may be taken advantage of or avoided.

A swift current often occurs in a narrow passage connecting two large bodies of water, owing to their considerable difference of level at the same instant. The several passages between Vineyard Sound and Buzzards Bay are cases in point. In the Woods Hole passage the maximum strength of the tidal streams is at about half tide.

Tide rips are made by a rapid current setting over an irregular bottom, as at the edges of banks where the change of depth is considerable.

Current arrows on charts show only the most usual or the mean direction of a tidal stream or current; it must not be assumed that the direction of a stream will not vary from that indicated by the arrow. The rate, also, of a stream constantly varies with circumstances, and the rate given on the chart is merely the mean of those found during the survey, possibly from very few observations.

FIXING POSITION.

Sextant method.—The most accurate method available to the navigator of fixing a position relative to the shore is by plotting with a protractor, sextant angles between three well-defined objects on

Digitized by Google

shore which are shown on the chart; this method, based on the "three-point problem" of geometry, should be in general use.

For its successful employment it is necessary: First, that the objects be well chosen; and, second, that the observer be skillful and rapid in his use of the sextant. The latter is only a matter of practice. Two observers are better for this method.

Near objects should be used either for bearings or angles for position in preference to distant ones, although the latter may be more prominent, as a small error in the bearing or angle or in laying it on the chart has a greater effect in misplacing the position the longer the line to be drawn.

On the other hand distant objects should be used for direction, because less affected by a small error or change of position.

The three-arm protractor or station pointer consists of a graduated brass circle with one fixed and two movable radial arms, the three beveled edges of the arms, if produced, intersecting at the exact center of the instrument. The edge of the fixed arm marks the zero of the graduation which enables the movable arms to be set at any angles with the fixed arm.

To plot a position, the two angles observed between the three selected objects are set on the instrument, which is then moved over the chart until the three beveled edges pass respectively and simultaneously through the three objects. The center of the instrument will then mark the ship's position, which may be pricked on the chart or marked with a pencil point through the center hole.

The transparent xylonite protractor is an excellent substitute for the brass instrument and in some cases preferable to it, as when, for instance, the objects angled on are so near the observer that they are more or less hidden by the circle of the instrument. The xylonite protractor also permits the laying down for simultaneous trial of a number of angles in cases of fixing important positions. Plain tracing paper may also be used if there are any suitable means of laying off the angles.

The value of a determination depends greatly on the relative positions of the objects observed. If the position sought lies on the circle passing through three objects (in which case the sum of the observed angles equals the supplement of the angle at the middle object made by lines from the other two) it will be indeterminate, as it will plot all around the circle. Such an observation is called a "revolver." An approach to this condition must be avoided. Near objects are better than distant ones, and, in general, up to 90° the larger the angles the better, remembering always that large as well as small angles may plot on or near the circle and hence be worthless. If the objects are well situated, even very small angles will give for

Digitized by Google

navigating purposes a fair position, when that obtained by bearings of the same objects would be of little value.

Accuracy requires that the two angles be simultaneous. If under way and there is but one observer the angle that changes less rapidly may be observed both before and after the other angle and the proper value obtained by interpolation.

A single angle and a range of two objects give in general an excellent fix, easily obtained and plotted.

Advantages of sextant method.—In many narrow waters where the objects may yet be at some distance, as in coral harbors or narrow passages among mud banks, navigation by sextant and protractor is invaluable, as a true position can in general be obtained only by its means. Positions by bearings are too rough to depend upon, and a small error in either taking or plotting a bearing might under such circumstances put the ship ashore.

In all cases where great accuracy of position is desired, such as the fixing of a rock or shoal, or of fresh soundings or new buildings as additions to the chart, the sextant should invariably be used. In all such cases angles should be taken to several objects, the more the better; but five objects is a good number, as the four angles thus obtained not only prevent any errors, but they at once furnish a means of checking the accuracy of the chart itself. If a round of angles can be taken the observer's accuracy is also checked. In the case of ordinary soundings a third angle need be taken only occasionally; first, to check the general accuracy of the chart, as above stated; second, to make certain that the more important soundings, as at the end of a line, are correctly placed.

If communication can be had with the shore, positions may be fixed with great accuracy by occupying with theodolite or sextant two known points of the chart. The third angle of the triangle, that between the two points at the position sought, should be measured as a check.

The compass.—It is not intended that the use of the compass to fix the ship should be given up; in ordinary piloting the compass, with its companion, the pelorus, may be usefully employed for this purpose, although less accurate than the sextant.

If the accuracy of the chart is doubtful, the compass should be used in preference to the sextant.

In fixing by the compass, it should always be remembered that a position by two bearings only, like that by two angles only, is liable to error. An error may be made in taking a bearing, or in applying to it the deviation, or in laying it on the chart. A third or check bearing should, therefore, be taken of some other object, especially when near the shore or dangers. A common intersection for the three lines assures accuracy.

Digitized by Google

When the three lines do not intersect in a point, the following rule holds: If the line drawn to the middle object falls to the right of the point of intersection of the lines to the two outside objects, the position of the observer was to the right of the line to the middle object; and if it falls to the left of the intersection his position was to the left of the line. Thus it will be seen that the assumption, that the position is at the center of the triangle formed by the intersecting lines, is incorrect.

Doubling the angle on the bow.—The method of fixing by doubling the angle on the bow is invaluable. The ordinary form of it, the so-called "bow and beam bearing," the distance from the object at the latter position being the distance run between the times of taking the two bearings, gives the maximum of accuracy, and is an excellent fix for a departure, but does not insure safety, as the object observed and any dangers off it are abeam before the position is obtained.

By taking the bearings at two points and four points on the bow, a fair position is obtained before the object is passed, the distance of the latter at the second position being, as before, equal to the distance run in the interval, allowing for current. Taking afterwards the beam bearing gives, with slight additional trouble, the distance of the object when abeam; such beam bearings and distances, with the times, should be continuously recorded as fresh departures, the importance of which will be appreciated in cases of being suddenly shut in by fog.

When the first bearing is 26½° from ahead, and the second 45°, the run between bearings will equal the distance at which the object will be passed abeam.

A table of multipliers of the distance run in the interval between any two bearings of an object, the product being its distance at the time of the second bearing, is given in the Light Lists and in Bowditch.

Danger angle.—The utility of the danger angle in passing outlying rocks or dangers should not be forgotten. In employing the horizontal danger angle, however, caution is necessary, as should the chart be inaccurate, i. e., should the objects selected be not quite correctly placed, the angle taken off from it may not serve the purpose. It should not, therefore, be employed when the survey is old or manifestly imperfect.

The vertical danger angle may be conveniently used when passing elevated points of known heights, such as lighthouses, cliffs, etc. The computation of the distance corresponding to the height of the object and its angular elevation requires for small distances merely the solution of a plain right triangle; the natural cotangent of the angle multiplied by the height in feet gives the distance in

Digitized by Google

feet. The convenient use of this method, however, requires tables such as those published by Capt. Lecky in his little book entitled "The Danger Angle and Offshore Distance Tables." This book very usefully extends the vertical angle method to finding a ship's position at sea by observing the angular altitude of a peak of known height and its bearing. The tables give heights up to 18,000 feet and distances up to 110 miles.

When the angles are not too large they should be observed "on and off the limb" and the index error of the sextant thus eliminated, in preference to correcting for it the single altitude. It must be remembered that in high latitudes the bearing of a distant object needs correction for the convergence of the meridians before being laid down on a Mercator chart. The correction may be found by the following formula, using the approximate position: The sine of the correction equals the product of the sine of half the difference of longitude by the sine of the middle latitude. It is applied on the equatorial side of the observed bearing and its effect is always to increase the latitude of the observer.

Soundings taken at random are of little value in fixing or checking position and may at times be misleading. In thick weather, when near or closing the land, soundings should be taken continuously and at regular intervals, and, with the character of the bottom, systematically recorded. By laying the soundings on tracing paper, according to the scale of the chart, along a line representing the track of the ship, and then moving the paper over the chart, keeping the line representing the track parallel with the course until the observed soundings agree with those of the chart, the ship's position will in general be quite well determined. This plan was suggested by Lord Kelvin, whose admirable sounding machine renders the operation of sounding possible in quite deep water, without slowing down the ship and consequent loss of time.

Pelorus.—All ships should be supplied with the means of taking accurate bearings both by night and by day. The standard compass is not always conveniently placed for the purpose; in such case a pelorus will be very useful, but the results are not as accurate as those obtained direct from the compass. The utility of such an instrument in ascertaining the change of bearing of an approaching ship should not be overlooked.

Position lines.—Among the various methods of fixing position at sea, the one which should be best understood and put to the most constant use is that employing position or Sumner lines. These lines give the most comprehensive information to the navigator with the least expenditure of labor and time. The knowledge gained is that the vessel must be somewhere on the line, provided the data used are accurate and the chronometer correct. As the information

Digitized by Google

given by one line of position is not sufficient to determine the definite location of the vessel, it is necessary to cross this line by another similarly obtained, and the vessel being somewhere on both must be at their intersection. However, a single line, at times, will furnish the mariner with invaluable information; for instance, if it is directed toward the coast, it marks the bearing of a definite point on the shore, or if parallel to the coast it clearly indicates the distance off, and so will often be found useful as a course. A sounding taken at the same time with the observation will in certain conditions prove of great value in giving an approximate position on the line.

The easiest and quickest way to establish a line of position is by employing the method of Marcq St. Hilaire, as modified by the use of tables of altitude. The principle of this method is one of altitude differences, in which the observed altitude is compared with the computed altitude for a dead reckoning, or other selected position, and the difference in minutes of latitude measured toward the body along the line of its azimuth, if the observed altitude is greater than the computed altitude, and vice versa. A line drawn at right angles to the line of azimuth through the point thus determined is the position line, somewhere upon which will be found the position of the vessel. The tables of altitude obviate the computation of the altitude and thereby greatly facilitate the establishment of the line.

A position line may also be found by computing two positions for longitude with two assumed latitudes, and drawing the line between them; or by drawing to the position obtained with one latitude a line at right angles to the bearing of the body as taken from the azimuth tables.

A very accurate position can be obtained by observing two or more stars at morning or evening twilight, at which time the horizon is well defined. The position lines thus obtained will, if the bearings of the stars differ three points or more, give an excellent result. A star or planet at twilight and the sun afterwards or before may be combined; also two observations of the sun with sufficient interval to admit of a considerable change of bearing. In these cases one of the lines must be moved for the run of the ship. The moon is often visible during the day and in combination with the sun gives an excellent fix.

The morning and evening twilight observations, besides their great accuracy, possess the additional advantage of greatly extending the ship's reliable reckoning beyond the limits of the ordinary day navigation, and correspondingly restricting the dead reckoning uncertainties of the night. An early morning fix in particular is often of great value. Though the same degree of

Digitized by Google

accuracy as at twilight can not be expected, night observations are very valuable and should be assiduously practiced.

Piloting.—The navigator, in making his plan for entering a strange port, should give very careful previous study to the chart and sailing directions, and should select what appear to be the most suitable marks for use, also providing himself with substitutes to use in case those selected as most suitable should prove unreliable in not being recognized with absolute certainty. Channel buoys seen from a distance are difficult to identify, because their color is sometimes not easily distinguished and they may appear equally distant from the observer even though they be at widely varying distances. Ranges should be noted, if possible, and the lines drawn, both for leading through the best water in channels, and also for guarding against particular dangers; for the latter purpose safety bearings should in all cases be laid down where no suitable ranges appear to offer. The courses to be steered in entering should also be laid down and distances marked thereon. If intending to use the sextant and danger angle in passing dangers, and especially in passing between dangers, the danger circles should be plotted and regular courses planned, rather than to run haphazard by the indications of the angle alone, with the possible trouble from bad steering at critical points.

The ship's position should not be allowed to be in doubt at any time, even in entering ports considered safe and easy of access, and should be constantly checked, continuing to use for this purpose those marks concerning which there can be no doubt until others are unmistakably identified.

The ship should ordinarily steer exact courses and follow an exact line, as planned from the chart, changing course at precise points, and, where the distances are considerable, her position on the line should be checked at frequent intervals. This is desirable even where it may seem unnecessary for safety, because if running by the eye alone and the ship's exact position be immediately required, as in a sudden fog or squall, fixing at that particular moment may be attended with difficulty.

The habit of running exact courses with precise changes of course will be found most useful when it is desired to enter port or pass through inclosed waters during fog by means of the buoys; here safety demands that the buoys be made successively, to do which requires, if the fog be dense, very accurate courses and careful attention to the times, the speed of the ship, and the set of the current; failure to make a buoy as expected leaves, as a rule, no safe alternative but to anchor at once, with perhaps a consequent serious loss of time.

Digitized by Google

In passing between dangers where there are no suitable leading marks, as, for instance, between two islands or an island and the main shore, with dangers extending from both, a mid-channel course may be steered by the eye alone with great accuracy, as the eye is able to estimate very closely the direction midway between visible objects.

In piloting among coral reefs or banks, a time should be chosen when the sun will be astern, conning the vessel from aloft or from an elevated position forward. The line of demarcation between the deep water and the edges of the shoals, which generally show as green patches, is indicated with surprising clearness. This method is of frequent application in the numerous passages of the Florida Keys.

Changes of course should in general be made by exact amounts, naming the new course or the amount of the change desired, rather than by ordering the helm to be put over and then steadying when on the desired heading, with the possibility of the attention being diverted and so of forgetting in the meantime, as may happen, that the ship is still swinging. The helmsman, knowing just what is desired and the amount of the change to be made, is thus enabled to act more intelligently and to avoid bad steering, which in narrow channels is a very positive source of danger.

Coast piloting involves the same principles and requires that the ship's position be continuously determined or checked as the landmarks are passed. On well-surveyed coasts there is a great advantage in keeping near the land, thus holding on to the marks and the soundings, and thereby knowing at all times the position, rather than keeping offshore and losing the marks, with the necessity of again making the land from vague positions, and perhaps the added inconvenience of fog or bad weather, involving a serious loss of time and fuel.

The route should be planned for normal conditions of weather, with suitable variations where necessary in case of fog or bad weather or making points at night, the courses and distances, in case of regular runs over the same route, being entered in a notebook for ready reference, as well as laid down on the chart. The danger circles for either the horizontal or the vertical danger angles should be plotted, wherever the method can be usefully employed, and the angles marked thereon; many a mile may thus be saved in rounding dangerous points with no sacrifice in safety. Ranges should also be marked in, where useful for position or for safety, and also to use in checking the deviation of the compass by comparing, in crossing, the compass bearing of the range with its magnetic bearing, as given by the chart.

Digitized by Google

Changes of course will in general be made with mark or object abeam, the position (a new "departure") being then, as a rule, best and most easily obtained. The pelorus should be at all times in readiness for use, and the chart where it may be readily consulted by the officer of the watch. The sextant should also be kept conveniently at hand.

A continuous record of the progress of the ship should be kept by the officer of the watch, the time and patent-log reading of all changes of course and of all bearings, especially the two and four point bearings, with distance of object when abeam, being noted in a book kept in the pilot house for this especial purpose. The ship's reckoning is thus continuously cared for as a matter of routine and without the presence or particular order of the captain or navigating officer. The value of thus keeping the reckoning always fresh and exact will be especially appreciated in cases of sudden fog or when making points at night.

Where the coastwise trip must be made against a strong head wind, it is desirable, with trustworthy charts, to skirt the shore as closely as possible in order to avoid the heavier seas and adverse current that prevail farther out. In some cases, with small ships, a passage can be made only in this way. The important saving of coal and of time, which is even more precious, thus effected by skillful coast piloting makes this subject one of prime importance to the navigator.

Change in the variation of the compass.[1]—The gradual change in the variation must not be forgotten in laying down on the chart courses and bearings. The magnetic compasses placed on the charts for the purpose of facilitating the plotting become in time slightly in error, and in some cases, such as with small scales or when the lines are long, the displacement of position from neglect of this change may be of importance. The date of the variation and the annual change, as given on the compass rose, facilitate corrections when the change has been considerable. The compasses are reengraved once in ten years; more frequent alterations on one spot in a copperplate would not be practicable.

The change in the variation is in some parts of the world so rapid as to need careful consideration, requiring a frequent change of the course. For instance, in approaching Halifax from Newfoundland the variation changes 10° in less than 500 miles.

Local magnetic disturbance of the compass on board ship.—The term "local magnetic disturbance" has reference only to the effects on the compass of magnetic masses external to the

[1] See H. O. Chart No. 2406, Variation of the Compass.

Digitized by Google

ship. Observation shows that disturbance of the compass in a ship afloat is experienced in only a few places on the globe.

Magnetic laws do not permit of the supposition that the visible land causes such disturbance, because the effect of a magnetic force diminishes so rapidly with distance that it would require a local center of magnetic force of an amount absolutely unknown to affect a compass half a mile distant.

Such deflections of the compass are due to magnetic minerals in the bed of the sea under the ship, and when the water is shallow and the force strong, the compass may be temporarily deflected when passing over such a spot; but the area of disturbance will be small unless there are many centers near together.

Use of oil for modifying the effect of breaking waves.—Many experiences of late years have shown that the utility of oil for this purpose is undoubted, and the application simple.

The following may serve for the guidance of seamen, whose attention is called to the fact that a very small quantity of oil, skillfully applied, may prevent much damage both to ships, especially of the smaller classes, and to boats by modifying the action of breaking seas.

The principal facts as to the use of oil are as follows:

1. On free waves, i. e., waves in deep water, the effect is greatest.

2. In a surf, or waves breaking on a bar, where a mass of liquid is in actual motion in shallow water, the effect of the oil is uncertain, as nothing can prevent the larger waves from breaking under such circumstances; but even here it is of some service.

3. The heaviest and thickest oils are most effectual. Refined kerosene is of little use; crude petroleum is serviceable when no other oil is obtainable, or it may be mixed with other oils; all animal and vegetable oils, such as waste oil from the engines, have great effect.

4. In cold water, the oil, being thickened by the low temperature and not being able to spread freely, will have its effect much reduced; a rapid-spreading oil should be used.

5. A small quantity of oil suffices, if applied in such a manner as to spread to windward.

6. It is useful in a ship or boat either when running, or lying-to, or in wearing.

7. When lowering and hoisting boats in a heavy sea the use of oil has been found greatly to facilitate the operation.

8. For a ship at sea the best method of application appears to be to hang over the side, in such a manner as to be in the water, small canvas bags, capable of holding from 1 to 2 gallons of oil, the bags being pricked with a sail needle to permit leakage. The waste pipes forward are also very useful for this purpose.

Digitized by Google

9. Crossing a bar with a flood tide, to pour oil overboard and allow it to float in ahead of the boat, which would follow with a bag towing astern, would appear to be the best plan.

On a bar, with the ebb tide running, it would seem to be useless to try oil for the purpose of entering.

10. For boarding a wreck, it is recommended to pour oil overboard to windward of her before going alongside, bearing in mind that her natural tendency is always to forge ahead. If she is aground the effect of oil will depend upon attending circumstances.

11. For a boat riding in bad weather to a sea anchor, it is recommended to fasten the bag to an endless line rove through a block on the sea anchor, by which means the oil can be diffused well ahead of the boat, and the bag readily hauled on board for refilling, if necessary.

Digitized by Google

Digitized by Google

CHAPTER I.

GENERAL REMARKS; TRADE; CURRENCY; COMMUNICATIONS; DOCKS; COAL; STANDARD TIME; WINDS; CLIMATE; NAVIGATION OF THE ARCHIPELAGO; PASSAGES; CURRENTS; TIDES; BUOYS; SIGNALS; PILOTS AND FISHING VESSELS' LIGHTS.

General remarks.—This volume, comprising the eastern portion of the Mediterranean Sea, commences at Cape Matapan (Greece) on the west and includes the islands of the Aegean Sea, together with the adjacent coasts of Greece, Bulgaria, and Turkey as far as the island of Rhodes and Cape Alupo on the east; including also the island of Crete or Candia and the southern shore of the Mediterranean Sea from Ras Ashdir, Libia (Tripoli), to Cape Alupo (Asia Minor).

Aegean Sea.—The Aegean Sea, so named by the ancients, comprises that part of the Mediterranean which, situated northward of Crete, is bounded on the west by the coast of Greece, on the north by Bulgaria, and on the east by the coast of Turkey, and contains the numerous and interesting islands commonly known as the Grecian Archipelago.

The islands are divided into two principal groups, the Cyclades and the Sporades. The Cyclades (pronounced Kiklades) are so named from their encircling the island of Delos, the birthplace of Artemis (Diana) and Apollo. The Sporades, which derive their name from the word meaning sown or scattered, are situated chiefly on the eastern side of the sea. Skyros and the Skopelos Islands, lying northeastward of Eubœa, are known as the northern Sporades.

All the islands are high; many are of volcanic origin; others are composed of white marble, of which the Parian from Paros is often mentioned by ancient writers. Some are fertile and picturesque, while others, mostly the smaller ones, are mere masses of rock, and destitute of vegetation. Their productions consist principally of wine, oil, figs, raisins, and fruits, especially the lemon and orange; sponges are found in the surrounding waters.

The coasts of Greece, Bulgaria, and Turkey are mountainous, deeply indented by gulfs, and contain many excellent harbors. The rivers that empty into the Aegean Sea are more deserving of notice from their classical associations than from their commercial importance; all are obstructed at their entrance by shoals, and few will admit boats.

Nomenclature.—In this volume certain places have their ancient names in italics, bracketed with their present names. Some places have their present local names in ordinary type, bracketed against those which mariners are more familiar with.

Digitized by Google

Population.—By the census taken in 1914, the total population of Greece and the islands belonging to Greece amounted to 4,821,300. The populations of Turkish ports and islands mentioned in this volume are little better than estimates. The same remark applies to the island of Crete.

Imports.—The principal imports into Greece are timber, iron, cotton, wool and silk manufactures, cotton yarn, grain, live stock, cotton, sugar, rice, salted goods, raw hides, sulphur, and tobacco.

Exports.—The principal articles exported from Greece are currants, lead, olive oil, wine, brandy, oranges, lemons, figs, emery, mineral ores, valonea, silk in cocoons, tobacco, cotton, sponges, soap, and wax.

Greece manufactures also for home consumption, glass, paper, wrought iron, dyes, and wool.

Grecian mining industries.—Generally speaking, these are only carried on on the small islands of the Cyclades and near the coast line, whence the transportation of the ores can be effected by the most simple means. The productions are iron ore, manganiferous iron ore, zinc ore, and argentiferous lead, and marble.

Greek currency.—This consists of notes and copper, silver, and gold coins. Notes and copper are most in use, silver coins are rare, and gold coins very rare, and are all foreign. The copper coins consist of 5 and 10 lepta pieces, equal, respectively, to a halfpenny, and a penny nearly.

The silver coins are the 50 lepta, drachma (franc), and 5 drachmæ pieces, equal to approximately 4¾d., 9½d., and 4s., respectively.

The gold coins are 5, 10, and 20 drachmæ pieces, the highest 500 drachmæ. Silver coins of 1 and 2 drachmæ are issued.

GREEK WEIGHTS AND MEASURES.

400 drams equal	1 oke.
44 okes equal	1 cantar.
18 cantars equal	1 ton.
1 kilogram of wheat equals	22 okes.
1 botza equals	2 okes.
48 okes equal	1 Greek barrel.

The following are the equivalents of the Greek in English weights and measures:

9 Greek drams equal	1 ounce (avoirdupois).
1 oke equals	45 ounces.
39½ okes equal	1 imperial hundredweight.
18 cantars equal	1 ton.
1 kilogram equals	1 bushel.
$3\frac{3}{10}$ okes equal	1 imperial gallon.
$3\frac{7}{8}$ stremmas equal	1 acre.
1 pike (land measure) equals	25½ inches.
1 pike (cloth measure) equals	27 inches.
1 royal pike equals	1 French meter.

Digitized by Google

Turkish currency.—The unit of the system for exchange is the lira or £T., a gold coin equal to 18s.

1 l.T. (Turkish lira, pound or sovereign) equals..18s. 2d.
1 l.T. equals .....100 gold pias.
1 l. equals .....$1\frac{1}{10}$ l.T.
10 l. equal... .....1 1 l.T.
1 l.T. equals .....$5\frac{8}{9}$ medjidiehs (about).
1 l. equals .....6 medjidiehs.
1 medjidieh equals.....19 silver pias.
1 l.T. equals .....102 to 104 silver pias.
1 pias (40 paras) equals.....2½d.
1 metalic (10 paras) equals.....½d. (about).

WEIGHTS AND MEASURES.

1 oke (400 drams) equals.....2.83 pounds.
1 kántar or quintal (44 okes) equals.....124 pounds.
1 ton (1,016 kilos) equals.....792 okes.
1 hundredweight (50.80 kilos) equals.....39.62 okes.
1 kileh (bushel) equals.....17 to 22 okes.[1]

The silver coins are 20 piaster pieces (medjidie), equal to 3s. 4d.; the 10 and 5 piaster pieces are of proportionate value.

	£	s.	d.
500 piasters (25 medjidie) equal	4	3	4
250 piasters (12½ medjidie) equal	2	1	8
100 piasters (5 medjidie) equal	0	16	8
50 piasters (2½ medjidie) equal	0	8	4
25 piasters (1¼ medjidie) equal	0	4	2

The 5-paras piece is a copper coin equal to ¼d.

The above values are only approximate.

Currency.—The monetary unit of Egypt is the Egyptian pound (£E) of 100 piasters = £1 0s. 6.1d.; the piaster is divided into 10 milliemes. The Egyptian gold coins are practically withdrawn from circulation, and the British sovereign, at 97.5 piasters, as well as the French 20-franc piece, at 77.15 piasters, are legal tender. The Egyptian silver coins are 1 piaster (about 2½d.), 2, 5, 10, and 20 piasters; the nickel coins, 1, 2, and 5 milliemes, and 1 piaster, and the bronze coins, one-quarter and one-half millieme.

Weights and measures.—One oke (400 dirhems) = 2.75 pounds; 1 kantár = 36 okes = 99 pounds; 1 diráa beledi (for stuffs) = 22.8 inches; 1 diráa mimari (for building) = 29.5 inches; 1 ardeb = 5.4 bushels; 1 feddan masri = 1.04 acres; 1 pic = 6.055 square feet.

The metric system is in general use. Water is sold by the ton of 1 cubic meter and coal by the British ton.

Communication—Railroads.—The Greek railroads connect the Piræus with Athens, Lavrion, Corinth, Patras, Olympia, Argos, Tripolitza, Nauplia, and Kalamata. A line has also been constructed from Athens to Bralo, a distance of 125 miles, and is being extended to Larissa. Volo is also connected with Larissa and Kalabaka.

[1] According to specific gravity of cereals measured.

Digitized by Google

In Asia Minor railroads run northward and southward from Smyrna; the former, after skirting the head of Smyrna Bay and making a detour of the western side of Mount Sipylus to Menemen, takes an easterly direction to Konieh, and extends beyond to Karapuna, thence, with two breaks, where the line has not been completed, to Aleppo, with branches to Mersina and Alexandretta. Eastward of Aleppo the line extends to Harran, a distance of about 150 miles on the way to Bagdad. The railroad from Smyrna connects at Afiun Kara Hissar with the lines from Constantinople and Angora. The southern line proceeds southward to Ephesus and Skala Nuova, from thence eastward to Dinair, distant from Smyrna 234 statute miles; branch lines communicate with the neighboring districts.

The only ports on the shores of the Aegean Sea in direct railroad communication with all parts of the Continent of Europe are Saloniki and Dedeagatch, which are also connected with each other; these lines unite at Nisch, in Servia, and join the Austro-Hungarian railroad at Belgrade.

Dedeagatch, in Macedonia, is the nearest port in direct railroad communication with Constantinople.

The total length of lines opened in Greece at the end of 1912 was 900 miles.

Steamers.—The numerous lines of steamers render sea communication easy and frequent over the whole extent of coast and islands embraced in this volume. Among the number are included the Pappayani, Cunard, Moss, and Leyland companies from Liverpool; Norddeutscher Lloyd, Deutsche-Levante, Austrian-Lloyd's, Florio-Rubattino, Messageries Maritimes de France, Fraissinet, Egyptian, and Russian Mail companies. Other smaller steamers supply means of transit between the minor ports.

Radio.—There is a radio station at Port Said (call letters S. U. B.). Radio stations are shown on H. O. chart No. 2180.

Telegraph.—There are telegraph cables from Tripoli to Malta and Syracuse; from Benghazi to Syracuse; and from Alexandria to Malta, Sitia (in Crete), Larnaka, and Port Said. Excepting the coast of Africa between Derna and about 150 miles westward of Alexandria and a part of the coast of Karamania, there is telegraphic communication with all parts of the world from the ports of any importance.

Two telegraph cables are laid from Syra to the Piræus. The following islands are connected together, viz:

Tinos, Syra, Paros, Naxos, Amorgos, Nio, Sikinos, Polykandro, Santorin, Anaphi, Milo, Siphano, Serpho, Thermia, and Zea.

Khios is connected with Syra, and thence with Athens.

A cable is laid from Zea Island to Ergasteria Bay. Thermia is also connected with Piræus and Syra.

Andros, Tinos, Mykoni, and Rhenea are connected with Syra and Eubœa.

Digitized by Google

Skyros, Skopelos, and Skiathos are also connected with the land lines of Eubœa.

Ægina is connected with the Piræus.

Samos is connected with the land line at Skala Nuova to Ephesus and Smyrna. Mityleni is also connected with the land line at Aivali.

Thaso is connected with Kavala.

Tenedos is connected with Khios, Lemnos, and Saloniki; also with the main line to Constantinople by a cable through the Dardanelles. A cable is also laid to Bashika bay.

Crete is connected with Syra by a cable laid from Megalo Kastron.

Cables are also laid from Khania to Zante and Megalo Kastron, from Megalo Kastron to Sitia, from Sitia to Rhodes, and from Sitia Bay to Alexandria. A cable is also laid from Rhodes to Marmarice. Thus, communication may be had with the principal places in the Ægean Sea and the rest of the civilized world.

For further information on this subject, see the descriptions of the places given in the body of this book.

Naval dockyards and establishments.—The principal naval dockyard belonging to the Greek Government is on the island of Salamis, near the Piræus. There is also a naval dockyard at Poros Island, on the southern shore of the Gulf of Athens.

The Turkish Government has no naval dockyard or establishment on the coast or islands comprised within the limits of this volume.

Crete possesses a naval dockyard at Suda Bay; it is, however, practically abandoned.

Docks.—Athens (Salamis Island), Syra, and Smyrna are the only ports, within the limits of this volume, where floating docks or patent slips exist or are under construction; there are no dry docks. These will be found described in their proper places. Two dry docks are under construction at the Piræus. There is a dry dock at Alexandria and a floating dock and two patent slips at Port Said.

Coal.—Coal may generally be obtained at any of the following ports: Piræus, Saloniki, Dedeagatch, Smyrna, Scio (Khios Island), Syra, St. Nikolo (Zea Island), Volo, Alexandria, Port Said, and Beirut. Details are given in the descriptions of the ports named.

Lloyd's signal stations are established at Zea Island, the Dardanelles, and Port Said.

Standard time.—The time used throughout Greece is Athens time, or 1 h. 34 m. 52.9 secs. fast of Greenwich. Mean time of the meridian of 15° longitude east of Greenwich, or 1 hour before Greenwich mean time, is standard time in Tripoli. Mean time of the meridian of 30° longitude east of Greenwich, or 2 hours before Greenwich mean time, is standard time in Egypt, Karamania, Cyprus, and Syria.

Digitized by Google

Winds.—The predominant winds in the archipelago are from the northward, varying from northwest to northeast, and which increase in force toward the northern part; from the end of September to the end of May these winds alternate with those from the southwestern quarter, which are more frequent when the winters are mild.

Winds from southeast to south-southeast are more frequent toward the end of June and in July, particularly in the channels near and on the coast of Asia; these winds, which increase gradually, are generally pleasant, though foggy in March and September. At the commencement of winter, there are at times heavy gales from this quarter. The most variable weather in the archipelago is from the beginning of November to the end of March, and gales of wind which at times attain nearly the force of a hurricane are during this period the most frequent. A gale generally happens a little before the equinox in March, the wind being always southerly, and known in Greece as "The forty saints' storm." Both southeast, and southwest winds blow frequently with great force near the solstices.

The Etesian wind or "Meltem" of the Turks is the most frequent in the fine season; it almost invariably commences about the end of March and continues until the end of August. It blows from the north, or northeast, occasionally fresh, with a clear sky but a misty horizon which obscures the land at a long distance, except perhaps about sunset. When the summits of the mountains are capped with grayish clouds, this wind is likely to last for some days; it moderates in the evening and freshens again in the morning.

Northerly winds blow with much force even in summer, and are usually cold and obscure the horizon; should it come on to blow suddenly in the day at this season, it will probably be a fine night. Summer gales are almost always preceded by calms, with a dark appearance of the sea round the horizon. From the middle of October to the latter end of March, the breaking up of the summer and winter seasons, there is a continuation of unsettled weather with frequent gales, rain, and sleet. During this period, when the sky is obscured and the gray clouds which collect in layers on the summits of the islands and mountains of the coast are suddenly detached, it is a certain sign of a gale.

Northerly winds are especially dangerous during the night when among the islands, as the weather may become overcast, with rain, hail, or snow, accompanied by a short heavy troublesome sea. When any signs of these gales appear, shelter should be sought under the lee of the islands or in the nearest port.

In March and April the Etesian winds alternate with strong southerly winds, and in May with light breezes or calms, which are not so common in June, July, and August. In May and June the sky

Digitized by Google

is usually clear and serene, the weather fine and sea smooth, with land and sea breezes.

During September the prevailing winds are southerly, but light, with calms. About the middle of October a strong cold northerly wind is periodically expected, followed by southerly breezes until the end of the month. In November strong southerly winds are prevalent; and in December, a little before or after the solstice, stormy winds blow from all directions and ultimately from the northward; in January northerly winds are mainly prevalent.

During winter the winds are often influenced in an easterly or westerly direction by the gulfs or inlets on either coast; on the European side both northerly and southerly winds have a tendency to blow from the westward, and on the Asiatic side from the eastward. Southerly winds often back round to the eastward and blow hard between south-southeast and east-southeast, with rain for several days; but more frequently southerly winds suddenly shift round by east to northeast and north and blow with great violence, and continue in that quarter for a long period until exhausted, seldom again shifting until completely blown out.

On changing from the southward round westward it seldom remains for any length of time between west-southwest and north-northwest, but should it remain in that quarter the weather soon clears and becomes fine.

Winds from the southwest or from the southern quarter are not common in the northern part of the archipelago, but in the western part they blow at times during the summer. In winter they are accompanied by thunder and lightning and at times change suddenly in a squall to the north with a rough sea. When the sky is charged with clouds from the southwest, with lightning, and the barometer falling or low, the wind may with certainty be expected from that quarter, particularly during November, December, and January; at other periods the southwest winds succeed those from the north, which back round by northwest and west, with increased force, clear weather, and but little rain.

In general, during summer and in fine weather in winter, land, and sea breezes prevail in the different gulfs, especially in those of Smyrna, Nauplia, and Saloniki; the sea breeze, called the "Imbat," commences to enter the gulfs about 10 a. m. and falls toward sunset; the land breeze springs up about 11 p. m. The Imbat in the Gulfs of Nauplia and Smyrna is often strong, and in the latter it causes a short troublesome sea; but the land breeze is never very strong.

The winds on the coast of Anatolia and neighboring islands are as follows: In the winter months, after a northeasterly wind, the sky becomes clear for a few hours, when it again gradually darkens, and in 12 or 15 hours a gale from southeast or south-southeast will

Digitized by Google

probably be blowing in the Gulf of Smyrna, from southeast in the strait of Khios, and from south-southeast and south along the coast. It generally comes on in the evening, but sometimes at night; toward morning it blows violently, and continues often till midnight, when it is succeeded by heavy rains, which last a few hours.

The wind will then suddenly shift to the southwest with strong and violent gusts; after this it moderates and becomes showery and squally, veering to west and northwest, in which quarter it seldom blows hard, when with a heavy shower of rain or hail it veers to north-northeast or northeast. A few hours before this change takes place the mountain tops are enveloped in dark and heavy clouds, though at times this does not take place until the above change of wind is effected.

The mountains of Kara Burnu Peninsula are remarkable for this appearance; for after the winds begin to blow, the clouds collect on their southwestern side and resemble snow, when it blows violently in the Strait of Khios.

The Gulf of Sandarli or Chandarli, northward of that of Smyrna, is remarkable for these winds; they continue thus variable during the months of November, December, January, and February. In March the weather becomes mild; in May and June the sky is clear and serene, the regular Imbat or sea breeze begins to set in, and is succeeded by the land wind. Toward the latter end of June and in July the sirocco winds blow occasionally. About the equinox it will rain for a day or two, accompanied with thunder, after which it becomes calm and serene, continuing so throughout October; in November it again becomes variable with strong gales.

White squalls.—The Grecian Archipelago is more particularly the scene of those sudden gusts of wind named white squalls, so called from their frequent occurrence under a cloudless sky and their action in causing the sea to assume a white appearance. They are due to the wind rushing down from the highland on the leeward side and striking the water at an angle, when they churn up the sea and cut off the tops of the waves into a spray, which gives a peculiar appearance that once seen can not be mistaken.

They are sometimes very violent, but their duration is short. They were particularly dangerous in the days of sailing vessels, but now that sailing vessels have been almost entirely superseded by steamers they cause more inconvenience than danger.

Climate.—The archipelago is very dry, the drought continuing generally without interruption from May until the middle or end of August, when a small quantity of rain may fall to alternate again with some weeks of dry weather. November, February, and March are the rainy months; but December may often be substituted for

Digitized by Google

November. The lowest degress of temperature in winter is seldom at freezing point and the highest in summer seldom exceeds 90°

Barometer.—The ordinary indications precede gales, and careful attention to the barometer, which generally rises with north and easterly winds and falls with those from the south and west, will render it almost impossible for seamen to be taken unawares.

Sea temperature.—The high summer temperature of the surface of the Mediterranean Sea is limited to a thin stratum, and then gives place to a uniform temperature which extends downward to the bottom. In the western basin, at a depth of 50 fathoms, the thermometer generally falls to 55° or 56°; and below this depth there is very little change down to 100 fathoms, where it usually stands at 54° or 55°; thence to the bottom, however deep, the temperature continues constant, the water below 100 fathoms having absolutely the same temperature of 54° or 55° throughout.

In the eastern basin the heat of the superficial stratum extends somewhat farther down, but the uniform temperature is always reached at less than 200 fathoms, and from this depth to the bottom (it may be at 2,000 fathoms) the temperature of 56° is found everywhere to prevail. In the archipelago the temperature is also constant at about 54° or 55° in depths of 100 fathoms and downward; the intermediate depths between 100 fathoms and the surface range from 55° to 76° and sometimes in the waters of the inclosed gulfs and bays even to 80° and 86°.

During winter, on the other hand, the temperature is uniform or nearly so from the surface to the bottom. It is obvious that the temperature varies with the seasons, and after the month of March the solar influence begins sensibly to raise both sea and atmospheric temperature. It appears that a higher surface temperature prevails over the eastern basin generally than over the western.

The above conditions differ completely from that which prevails in oceanic areas generally, and contrasts especially with that which is found in the Atlantic at similar depths; for there, after passing through the superheated stratum, the thermometer falls with the depth to 36°, though by no means at a uniform rate.

Winds and weather—Coasts of Libia (Tripoli) and Egypt.—On the coast of Africa in the vicinity of the town of Tripoli land and sea breezes prevail from April to October, but sometimes there are strong northerly and northeasterly winds, which cause a heavy sea. The southerly land breeze generally begins from 8 to 9 p. m.; it continues all night and veers to the westward at sunrise; after an interval of calm the cool northeasterly or easterly sea breeze sets in, freshens at noon, and fails at sunset.

From November to March northerly and northwesterly winds prevail, with occasional northeasterly winds, which sometimes veer

Digitized by Google

to southeast at night when the weather is fine; there is often much rain. Westerly and west-northwesterly gales are the strongest; the weather is then generally cold and clear. In January and February the winds are more moderate than in the preceding months, but in March strong gales from all directions are experienced, accompanied by squalls and rain; these are succeeded by more settled weather in April, when the land and sea breezes begin. Fog is not uncommon on this coast, especially in the morning.

In the Gulf of Sidra northwest to northeast winds prevail, becoming northerly at the head of the gulf; the land wind hauls to the eastward on the eastern shore, and to the westward on the western shore, when from the southward the air is most oppressive and almost suffocating. Northerly gales seldom penetrate to the head of the gulf, but they cause a heavy sea on its low and sandy shore.

Calms are frequent, and the accumulation of vapor at this time is so considerable as sometimes to obscure the sun. The fog of the gulf is not the moist mist of the north, but a dry dense haze similar to that which occurs in several parts of the Mediterranean during the hot season. The strange phenomena known as mirage is often seen in this gulf; the Arabs call it sarâb.

Fom January to March, inclusive, hard northeasterly squalls, named gharra, are experienced; they are sudden, frequent, accompanied by heavy rain, thunder, and lightning, and are much feared.

Ras Sem, the eastern point of the Gulf of Sidra, appears to divide northerly winds; the wind westward of the ras becomes northeast, and eastward of it northwest.

On the coast of Derna, between Benghazi and the Gulf of Bombah, gales are often preceded by a heavy swell setting in the day before from the direction of the approaching wind. As a general rule the wind freshens quickly and the barometer gives little warning, but the sea soon subsides after a gale.

From Ras Sem to Alexandria westerly winds, veering through north to east, are often violent and sometimes begin suddenly, but usually the weather is fine. The great heat of summer is tempered by sea breezes, and the winters are remarkably mild. The winds on this coast are, to an extent, periodical; northerly winds prevail from May to September, inclusive; easterly winds in October and November; and southerly and westerly in December, January, and February, when the weather becomes very variable and stormy and northwest and west winds are often very strong; in March southerly winds prevail.

On the coast of Egypt from about October to March northwesterly to southwesterly gales occur and are accompanied by heavy rain. In March the simoon, or hot south wind, commences and blows at intervals until May, sometimes for three or four days continuously; the

Digitized by Google

air during the simoon is thick and heavy, with a livid tint, and the heat is almost suffocating; clouds of fine dust, flies, and small insects are blown offshore with this wind.

At the beginning of June light easterly winds commence during the day and the sky is cloudless; in the night northerly breezes cool the air, and dew is abundant.

Coast of Karamania.—During summer the sea breeze is generally fresh by day and the land breeze light at night. In April, May, and June the weather is usually serene, with a clear sky. In July and August a white mist often occurs, limiting the visibility to a few miles. In September clouds collect to the southward, and though there is no change in the wind, the mist disperses and the weather becomes pleasant. The temperature reaches 74° in May, 86° in July, and sometimes 90° in August.

Coasts of Cyprus.—In summer the heat is very great, but then the sea breeze is moderately regular from about 8 a. m. until about 3 to 6 p. m.; it is succeeded by calm until about 1 to 2 a. m., when the land breeze begins and continues until about sunrise; these winds toward the end of summer are often very strong.

The imbatto is the sea breeze on the northwest coast of the island and the land breeze on the southeast; these breezes cease about the middle of September, and thence the period of greatest heat lasts until the latter part of October, when the rainy season usually commences and continues until April.

Northerly winds are very cold in winter, but warm in summer; they prevail in December and January.

Gales.—Northeasterly gales occur in winter and southwesterly in summer, but the latter are never very severe. The winter gales usually last two or three days and end from the southwestward. Easterly and southeasterly gales are uncommon, and when they occur they generally soon veer to the southwest.

Swell.—The amount of swell which accompanies the wind is often more dependent on the general weather in the eastern Mediterranean than on local conditions; southwesterly winds which occur in winter at Larnaka are felt over a large area and are almost always accompanied by a swell which produces a more or less disagreeable surf on the beach, although the wind is offshore.

Fog.—Fog is rare, but it occurs more often at the western end of the island than at the eastern; it appears with light southerly or southwesterly winds and only lasts a few hours.

Temperature.—January, with a mean temperature of 51°, is the coldest month; in July and August the mean temperature is 81°.

Rainfall.—The rainfall is generally greatest on the north and west coasts and on the mountains, and least on the southeast coast; approximately it is over 30 inches on Mount Troodos, between 20 and

Digitized by Google

30 inches on the slopes of Mount Troodos and on the Kyrenia and Karpass Mountains, from 15 to 20 inches on the plains round Limasol, and often under 12 inches on the plains round Nicosia, Famagusta, and Larnaka. The rain falls principally from November to April, especially in November and December; July and August are dry; rain is rare and small in quantity in May, June, and September.

Coast of Syria.—Westerly winds prevail on this coast, hauling to the southward in winter and to the northward in summer. During April and May hot southerly and easterly winds are frequently experienced, usually after a few days of calm weather; they are preceded by a low barometer and are generally followed by rain. In May, June, and part of July southwest winds prevail.

From April to October land and sea breezes prevail, with occasional showers. Sometimes there is no sea breeze and at other times it is fresh from west-northwest to northwest, but it always fails before night and does not set in again until 10 a. m. the next day. In July and August the nights are hot and calm. During summer there are sometimes northwesterly winds, which seldom blow hard. Very vivid lightning in the north or northeast, with an unsettled appearance, indicates a shift of wind accompanied by heavy rain.

About the beginning of October a southeasterly wind usually sets in and is accompanied by rain, thunder, and lightning; it veers gradually to southwest and blows hard for a day or two, after which fine weather, with occasional fresh northerly winds, generally sets in until November, when gales commence. Gales are very frequent in January and February; they are indicated by a falling barometer, an overcast sky, and rain with vivid lightning, the mountains being usually covered with clouds and mist; they generally commence from southeast or south, and veer to southwest in heavy squalls. If the wind remains southwest or west-southwest it may blow hard, but the sea is comparatively smooth. Should the wind, however, veer to northward of west, it will probably go to northwest, from which direction it sometimes, but rarely, blows with great violence.

Generally after gales or heavy rain a north to northeasterly breeze, which is occasionally fresh, sets in for a day; light westerly winds and calms succeed with a land breeze at night.

The wind sometimes differs according to the locality, thus near Ras seh Shuka the wind may be southwest southward of the ras, while the wind is northeast northward of it. Northeast wind is rare southward of the ras.

In the Gulf of Iskanderun the winds are extremely variable and often squally, sometimes blowing from all directions several times in a day. Raghiehs, which are strong easterly gales, occasionally occur in winter in the vicinity of Alexandretta; they are rare, of short duration, and do not extend far from the shore. They are indicated by

Digitized by Google

the clouds which envelop the summits of the mountains at the head of the gulf becoming torn and wavy, like white smoke, and projecting horizontally in feathery streaks.

Fog.—In April thick fog occurs at times on the cost of Syria which disperses toward the middle of the day.

Barometer.—The barometer on the coast of Syria is a good guide; it indicates changes of the weather and even passing squalls. Its mean height is generally lower in summer than in winter; during summer it does not rise above 29.9 inches, while in winter, after squally weather and rain, it sometimes rises as high as 30.02 inches and stands above 29.9 inches, while the sky is clear; when it falls to 29.8 inches rain and southerly winds may follow and below 29.7 inches bad weather.

Temperature.—The climate on the coast of Syria during summer is very fine; the temperature in May is from 60° to 76°, in June from 75° to 84°, in July from 78° to 87°, in August from 82° to 86°, in September from 78° to 86°, and in October from 74° to 83°.

Navigation of the archipelago.—The navigation of the archipelago, though easy, requires constant attention, and a place of shelter should always be kept in view, so that safety may be assured before dark in the event of an approaching gale, as the weather may become so thick that among the labyrinth of islands the land may hardly be seen in time to avoid it. In general, when bound up the archipelago, if there is the least appearance of a gale from the northward, there should be no hesitation in seeking temporary shelter at the nearest anchorage, for nothing can be gained by keeping at sea and the vessel's position may become more critical as the weather gets worse.

A vessel may always anchor under the lee of an island with northerly winds, for though at times they blow with much violence, they never shift suddenly to the southward and there is always a sufficient interval of moderate weather to permit leaving the anchorage. It is not the same, however, with southerly winds; with these winds a sailing vessel should never anchor on the northern side of an island or any land, if it can possibly be avoided, as the winds from this quarter generally shift suddenly in a squall to the north or northeast and blow with such violence that a vessel could not get under way.

A steamer, in case of necessity, anchoring on the northern side of an island or point of land, should be in such a position as will enable her to leave with ease and facility at any moment. As southerly winds increase in force gradually, there is generally time to seek the requisite shelter.

Passages.—Vessels bound from the Mediterranean to the Dardanelles, Athens, Saloniki, Smyrna, or any port in the archipelago

Digitized by Google

should make Cape Matapan and pass through the Elaphonisos or Cervi Channel, taking care to guard against the current there, which generally sets to the westward at the rate of 1 mile per hour. After rounding Cape Malea, if bound to Athens, the course is westward of Belo Pulo Islet for Cape Zourva, the eastern extremity of Hydra Island, after passing which steer midway between Cape Skyli and the western extremity of St. Georgio Island toward Athens.

When passing Belo Pulo Islet in thick weather caution is necessary, as the currents are often strong and the direction is uncertain.

If bound for the Dardanelles, the route after passing Belo Pulo is through the Zea and Doro Channels for Tenedos Island.

If bound to Saloniki, after passing through the Doro Channel vessels may pass either round eastward of Skyros and the small islets of Piperi and Psathura for Cape Kassandra, or west of Skyros and through the channel between Skopelos and Skiathos.

If bound to Smyrna, the same route may be followed as that directed for the Dardanelles as far as the Doro Channel, thence passing northward of the Kaloyeri Rocks and either rounding well to the northward of Psara Island, on account of the current, or passing between it and Cape St. Nikolo, the northwestern point of Khios Island, and proceeding northward of the peninsula of Kara Burnu into the Gulf of Smyrna.

Another route to Smyrna may be followed after passing through the Cervi Channel by shaping a course to pass through the Siphano Channel, guarding against the strong and uncertain currents when near Falconera Islet and giving Cape Phillippo, the northern extremity of Siphano Island, a wide berth in order to avoid the sunken rock off it, and also to allow for the southwesterly current which in light northerly winds sets toward it. After passing through Siphano Channel, steer for Mykoni Channel, passing between Aspro Islet, off Syra Island, and Nata Islet; thence through Mykoni Channel, which is 4½ miles in width, and the southwesterly current not so strong as in the Doro. When through the Mykoni Channel, steer to pass southward of Khios Island, through Khios Strait, and into the Gulf of Smyrna.

Currents.—The currents in the archipelago are irregular in strength and direction. In general they run to the southward, but are greatly influenced by the winds, and especially in the western part. As a general rule, the currents are always stronger during and after northeasterly winds than with those from the southern quarter.

When the winds are from northeast to east, the rapid current from the Dardanelles passes on both sides of the island of Lemnos and runs toward the western part of the Archipelago and through Doro Channel with considerable velocity. It runs with great strength through Steno Pass (the narrow channel between Andros and Tinos

Digitized by Google

Islands), and through the side channel which separates Nikaria from Mykoni, but is less rapid in Mykoni Channel, which separates that island from Tinos.

On leaving these channels and entering the southwestern part of the archipelago it loses its velocity, and between Cape Malea and Crete unites with the general westerly current, which is also more or less affected by the force and direction of the wind.

Besides the usual southerly set, there are local or eddy streams; thus to the northward of Thaso and Samothraki Islands the current has been observed to run strong to the eastward; at Tenedos, with a long-continued southerly wind, the southerly current ceases for a time. In the Gulf of Smyrna, and particularly during summer, the strong sea breezes force the water toward the head of the gulf, causing at times, with the fall of the wind, a westerly set of 1½ knots an hour.

No exact law can be given with respect to these currents, more especially in the southern part of the archipelago and in the channels east and west of Crete. It sets almost continually to the southward, but it is at times irregular and depends (as elsewhere) much on the force and direction of the winds, both local and those at a distance when strong.

Thus, southerly gales (especially in autumn, when the water brought down by rivers is at its minimum) will entirely reverse the archipelago currents, causing a flow back to the northward and through the Dardanelles and Bosporus into the Black Sea, instead of its usual direction out of that partly fresh water basin. Southerly and southwesterly breezes will likewise cause an easterly current in the southern part of the archipelago, which then uniting with that from the Dardanelles greatly increases the southerly current between the islands of Kaso and Crete and between Scarpanto and Rhodes.

The coast of Crete is subject to variable currents, being influenced greatly by local winds, but the descending currents from the Dardanelles and the encircling current from the coast of Egypt by Syria and Karamania unite in causing a predominating southerly current throughout the archipelago and southwesterly current on the coast of Crete, of from ½ knot to 1½ knots an hour. These currents have been invariably found to be superficial, having a depth of from 30 to 50 fathoms only, and decreasing in strength with the depth. The only rule, therefore, that can be given as a caution to the navigator, especially for the southern part of the archipelago and the channels approaching it on the east and west of Crete, is to allow for a current of from 1 to 1½ knots an hour in the direction of the wind, when it amounts to a fresh or even a moderate breeze; when there are such currents in the offing and open channels, there will of course be inshore eddies likewise.

Digitized by Google

Therefore, in navigating these narrow seas at night some consideration of these local influences must be allowed as a precaution, particularly where neighboring channels and bays may easily be mistaken for each other by a stranger approaching them, even with the best charts; more especially while there are so few lights to guide him from doubt and danger and such sources of error as may exist in a total dependence upon direct courses and distances, where the currents are uncertain, and where clouds obscure the bolder landmarks and mountains indicated upon the charts of this stormy archipelago.

Currents—Coasts of Libia (Tripoli) and Egypt.—The current on the coasts of Libia (Tripoli) and Egypt generally sets eastward, but it is influenced by gales, so that it sometimes sets even in the contrary direction for a short time. A part of the easterly current appears to turn southwestward at Ras Sem and run along the coast to the Gulf of Sidra.

During the rising of the Nile, which commences in June and ends in September, the easterly current off the coast of the delta is much influenced by the water flowing into the sea and often becomes variable off the Damietta mouth, but the general set is still to the eastward.

Coasts of Syria and Karamania.—It appears that the general easterly current on the north coast of Africa turns northeastward and northward on the coast of Syria, where it becomes weak and variable, affected by the winds, and sometimes sets southward, but more generally northward; its rate is only occasionally, and with strong westerly winds, over 1 mile an hour.

The current on the coast of Karamania, unless affected by gales, generally sets westward, its rate increasing as the distance form the coast of Syria becomes greater. A short distance from the land it is weak, but near the coast its rate is occasionally considerable.

The direction and rate of the currents in the extreme eastern part of the Mediterranean are not yet thoroughly known.

Coasts of Cyprus.—During June, July, and August the current usually sets eastward on the north coast of Cyprus at a rate of from ½ to 1 mile an hour, increasing, with strong westerly winds, to 2 miles an hour, and on the west and south coasts, between Cape Arnauti and Cape Kiti, the current generally sets eastward at a rate of from ½ to ¾ mile an hour.

On the southeastern coast, between Cape Kiti and Cape Andreas, the current generally sets westward, but is much affected by the wind.

Tides.—The level of the water in the Aegean Sea is, as in most parts of the Mediterranean, more influenced by wind than by tide; but in those places in which the rise and fall of the latter is appreciable it is regular, especially at springs.

Digitized by Google

The effect of tide at Euripo Bridge, at which place the spring tide rises about 2 feet, is very pronounced. Here the stream runs to the northward at half ebb and to the southward at half flood, attaining a velocity of 6 or 7 knots an hour. At neaps the stream is irregular and its strength only from ½ to 1 knot an hour, and at times but little movement is experienced.

At the entrance of Talanta Channel in the vicinity of the Likhades Islets the tides correspond with those of Euripo, but are less in strength, the flood running in at from 1¼ to 2 knots an hour and ebb setting out and to the northward at the same rate; there is a sensible rise and fall here affected at times by the wind. At Volo the rise and fall at full and change of the moon is about 8 inches.

At Smyrna the water level rises with a southerly wind and falls with a northerly. The variation in the level is from 3 to 3½ feet, but at Khios and places adjacent it is only about 2 feet.

On the coast of Candia or Crete, in fine weather, at about the full and change of the moon, the rise and fall is from 6 to 8 inches.

Lifeboats and life-saving stations are inserted on large scale charts of harbors and anchorages and not on other charts.

Tunny fisheries.—During certain seasons of the year fishing nets of large size (madragues or tonnara) are moored in places off the coast of Libia (Tripoli) for the purpose of catching tunny fish. The nets are sometimes upward of 1 mile offshore, and should be avoided; in cases they are marked by buoys, to which a lantern is attached at night.

Buoyage system—Turkey.—The starboard side of a channel is that side which would lie on the starboard hand of a vessel approaching from seaward. That side of the channel which would lie on the port hand of a vessel approaching the channel is consequently the port side of the channel.

Red conical buoys will be placed on the starboard side and white can buoys on the port side of a channel or strait.

Small red and white spherical buoys, fitted with staffs, will be placed on shoals which occur in the middle of a channel or strait, and which can be passed on both sides by shipping.

Spherical buoys placed on a shoal lying in the middle of a channel will be furnished, depending on their condition, either with a red cylinder or other top mark.

In the case of a channel or strait which can not cenveniently be buoyed on both sides a single row of either red or white buoys will be laid down. Some of the buoys forming this row may be conical and others can buoys. In order to enable the buoys inside the channel to be easily seen and distinguished a beacon buoy will be placed at the entrance of the channel, where the nature of the background renders this necessary; its top mark will be entirely red and its other parts

Digitized by Google

red or white, according as it lies in the line of buoys marking the starboard or port side of the channel.

In the case of winding channels and inlets containing numerous and extensive shoals, where the fairway for shipping may be considered as divided into a number of disconnected zones, beacon buoys will be placed at the extremities of each zone, in order that the limits may be clearly perceived and a reliable guide to shipping afforded.

As regards the fairway both the topmarks and the other parts of the buoys must be painted red on the starboard side; on the port side the topmarks red and their other parts white. The topmarks of the beacons on the shoals in the fairway, which can be passed on both sides by shipping, must be entirely red, the other parts being painted with horizontal red and white stripes.

The topmarks belonging to one zone will be distinguished from those of other zones by their form. In places of this kind light-buoys and fixed beacons of peculiar color and carrying special topmarks can be used.

Reckoning from the entrance to the channel, the buoys on the starboard side will have odd numbers painted on them in black and those on the port side even numbers. On the starboard side of a channel or strait a red-colored staff or pole beacon or an uncolored mast beacon will be placed; on the port side a white-colored beacon, without a staff, or an uncolored perch beacon (the branched stump of a tree).

On shoals situated outside a channel spar buoys, beacon buoys, any kind of buoy fitted with a staff, or fixed beacons will be placed on the shoal or in its vicinity. These will always be painted red. The other parts, as occasion may require and to be readily distinguished, will be painted white or red. Where their position renders it necessary, shoals will in some cases be marked by bellbuoys, light-buoys, or whistlebuoys. If it is only necessary to mark shoals on one side, beacons either without topmarks or carrying special ones will be used.

Topmarks are used to indicate the direction in which the shoal lies. In the case of exceedingly small shoals, situated either inside or outside the channel, where it is not considered necessary to surround them with other buoys, and where shipping can approach close to the beacons, the topmark will be a cylinder of height equal to its diameter. While this topmark may also be carried by a buoy marking a sunken vessel, it may not be used in any other place.

In the case of an extensive shoal, situated inside or outside the channel where it is considered necessary to place buoys, they will carry topmarks as described below:

On a buoy or beacon on the northern side of shoal, two conical topmarks, each point upward.

Digitized by Google

On a buoy or beacon on the southern side of shoal, two conical topmarks, each point downward.

On a buoy or beacon on the eastern side of shoal, two conical topmarks, upper one upward, lower one downward.

On a buoy or beacon on the western side of shoal, two conical topmarks, both pointing toward each other.

To indicate the position of a submerged wreck conical buoys, truncated conical buoys, or cask or barrel buoys will be used; they will be painted green, and have in Turkish the word for "Wreck" written on them in white. These wreck buoys will carry a staff and, according to their position, will exhibit a cylindrical topmark.

To mark the position of telegraph cables, green spherical buoys are used. On these buoys the word for "Telegraph" or the equivalent for letter "T" will be painted in white, in Turkish character.

In order to indicate the limits of quarantine areas, yellow buoys or conical beacons must be used.

In order to denote the limits of areas temporarily closed to shipping, while appropriated for experiments or practice from guns and torpedoes, yellow cask or barrel buoys, fitted with small pendants, will be used.

Buoys and beacons on the coasts of Italy are to be painted red on the port and black on the starboard hand, entering a port or channel. The new coloring will be applied gradually, and notice will be given as the colors are altered.

Signals to be made by vessels approaching ports when inconvenienced by searchlights (temporarily suspended).—Any vessel approaching a port in the British Empire when searchlights are being worked, and finding that they interfere with her safe navigation, may make use of the following signals, either singly or combined:

(*a*) By flashing lamp, four short flashes followed by one long flash.

(*b*) By whistle, siren, or foghorn, four short blasts followed by one long blast.

Whenever possible, both flashing lamp signals and sound signals should be used.

On these signals being made, the searchlights will be worked, as far as circumstances will permit, so as to cause the least inconvenience, being either extinguished, raised, or altered in direction.

The signals should not be used without real necessity, as unless the vessel is actually in the rays of a searchlight it is impossible to know which searchlight is affected. The signals should be repeated until the inconvenience is removed.

NOTE.—These signals are designed to assist mariners, and do not render the Government liable in any way.

Digitized by Google

Pilotage—Steering commands.—The French system of steering commands, in which the terms starboard and port signify that the vessel's head is to go to starboard and port and not the helm, has been adopted by Italy.

Greek pilots give their steering orders in accordance with the French system.

Pilots—Italy.—Pilot boats are painted black with a white stripe, and the word "Pilota" on the bows and stern, with, in the case of a sailing vessel, the letter "P" on each sail, and, if a steam vessel, on each side of her funnel.

The vessels carry at the masthead by day a square flag—blue, white, blue, horizontally, with the letter P in blue in the middle of the white part.

Vessels requiring a pilot by day should either—

(*a*) Hoist the national flag with a white border;

(*b*) Make the signal P. T.; or

(*c*) Hoist flag S.

And at night—

(*a*) Burn a blue light; or

(*b*) Show a white light occulted at short intervals.

Pilots are forbidden to take vessels in tow.

Pilot vessels—Lights.—Pilot vessels, when engaged on their station on pilotage duty, do not show the lights required for other vessels, but carry a white light at the masthead, visible all round the horizon, and also exhibit a flare-up light or flare-up lights at short intervals, which shall never exceed 15 minutes.

On the near approach of or to other vessels they must have their sidelights lighted and flash or show them at short intervals to indicate the direction in which they are heading, but the green light must not be shown on the port side nor the red light on the starboard side.

A pilot vessel of such a class as to be obliged to go alongside a vessel to put a pilot on board may show the white light instead of carrying it at the masthead, and may, instead of the sidelights above-mentioned, have at hand ready a lantern with a green glass on the one side and a red glass on the other, to be shown as prescribed above.

A steam pilot vessel, exclusively employed for the service of pilots licensed or certified by any pilotage authority or the committee of any pilotage district when engaged on her station on pilotage duty and not at anchor, carries, in addition to the lights required for all pilot boats, at a distance of 8 feet below her white masthead light, a red light, visible all round the horizon, and of such a character as to be visible on a dark night, with a clear atmosphere, from a distance of at least 2 miles, and also the colored sidelights.

Digitized by Google

When engaged on her station on pilotage duty, and at anchor, she carries, in addition to the lights required for all pilot boats, the red light above mentioned, but not the colored sidelights.

Pilot vessels when not engaged on their station on pilotage duty carry lights similar to other vessels of their tonnage.

Fishing vessels—Lights.—The following regulations with regard to fishing vessels have been adopted by the Italian Government:

Fishing vessels and fishing boats, when under way, and when not required by these regulations to carry or show the lights hereinafter specified, shall carry or show the lights prescribed for vessels of their tonnage under weigh.

(*a*) Open boats, by which it is to be understood boats not protected from the entrance of sea water by means of a continuous deck, when engaged in any fishing at night with outlying tackle extending not more than 150 feet horizontally from the boat into the seaway, shall carry one all-around white light.

Open boats, when fishing at night with outlying tackle extending more than 150 feet horizontally from the boat into the seaway, shall carry one all-round white light, and, in addition, on approaching or being approached by other vessels, shall show a second white light at least 3 feet below the first light and at a horizontal distance of at least 5 feet away from it in the direction in which the outlying tackle is attached.

(*b*) Vessels and boats, except open boats, as defined in subdivision (*a*), when fishing with driftnets, shall, so long as the nets are wholly or partially in the water, carry two white lights where they can best be seen. Such lights shall be placed so that the vertical distance between them shall be not less than 6 feet and not more than 15 feet, and so that the horizontal distance between them, measured in a line with the keel, shall not be less than 5 feet and not more than 10 feet. The lower of these two lights shall be in the direction of the nets, and both of them shall be of such a character as to show all round the horizon and to be visible from a distance of not less than 3 miles.

Within the Mediterranean Sea sailing fishing vessels of less than 20 tons gross tonnage shall not be obliged to carry the lower of these two lights; should they, however, not carry it they shall show in the same position (in the direction of the net or gear) a white light, visible from a distance of not less than 1 mile, on the approach of or to other vessels.

(*c*) Vessels and boats, except open boats as defined in subdivision (*a*), when line fishing with their lines out and attached to or hauling their lines, and when not at anchor or stationary, shall carry the same lights as vessels fishing with drift nets. When shooting lines or fish-

Digitized by Google

ing with towing lines they shall carry the lights prescribed for a steamer or sailing vessel under way respectively.

Within the Mediterranean Sea sailing fishing vessels of 20 tons or more gross tonnage shall not be obliged to carry the lower of these two lights; should they, however, not carry it, they shall show in the same position (in the direction of the lines) a white light, visible from a distance of not less than 1 mile, on the approach of or to other vessels.

(*d*) In fog, mist, falling snow, or heavy rainstorms drift-net vessels attached to their nets, and vessels when trawling, dredging, or fishing with any kind of dragnet, and vessels fishing with their lines out, shall, if of 20 tons gross tonnage or upward, respectively, at intervals of not more than one minute make a blast; if steamers, with the whistle or siren; and if sailing vessels, with the foghorn; each blast to be followed by ringing the bell.

Fishing vessels and boats of less than 20 tons gross tonnage shall not be obliged to give the above-mentioned signals, but if they do not they shall make some other efficient sound signal at intervals of not more than one minute.

Libia (Tripoli), the eastern of the Barbary States in northern Africa, lies between Tunis and Egypt, and has an area of about 410,000 square miles. The coast is about 1,100 miles in length, between Ras Ashdir, on the west, and Sollum, on the east; from Ras Ashdir it is generally low and sandy eastward to Ras Misrata; it is then deeply indented by the Gulf of Sidra, the shores of which are also low and sandy, with rocky reefs extending some distance seaward. The coast of the promontory of Derna, to the eastward of the Gulf of Sidra, is high, and thence it is high, or low with sandhills, eastward to Sollum.

A chain of mountains, the summits of which are about 4,000 feet high, runs parallel with the coast of Libia (Tripoli) about 10 miles inland.

Except in the vicinity of the town of Tripoli, which is fertile and well cultivated, the greatest part of the territory is barren desert, interspersed at wide intervals with some oases. The country is treeless, but there are some palm and olive groves near the coast and in a part of Derna; there are but few watercourses.

The population, which is very mixed, according to a census taken in 1911, was 523,176 natives, including Libian Berbers, Moors, and a few Arabs; also some 5,000 or 6,000 Europeans, chiefly Maltese, and some 24,000 Jews.

Government.—Tripoli, formerly a vilayet of the Ottoman Empire, was transferred to Italy by the treaty of Ouchy (1912) and named Libia by the Italians. It is divided into Tripolitania (Tripoli)

Digitized by Google

and Cyrenaica (Cirenaica) Provinces, each having a governor, residing, respectively, at Tripoli and Benghazi.

Harbors.—Tripoli Harbor affords shelter to vessels of 22 feet and less draft, and Marsa Tebruk to vessels of all sizes; there are no other places which afford shelter even to vessels of moderate draft.

Products.—The products are corn, fruit, silk, cotton, tobacco, madder, saffron, esparto grass, castor oil, senna, and dates. Cattle, ivory, wool, cereals, and other agricultural produce, when sufficient rain causes a good harvest, are exported, principally to Malta. The sponge fishery on the coast is in the hands of Europeans, and is carried on, in summer only, by numerous small craft; the best sponges are found to the westward of the town of Tripoli.

Egypt, the northeastern part of Africa, comprises the oases of the Libian Desert, the delta and valley of the Nile as far as the second cataract, and the peninsula of Sinai.

The coast is about 460 miles in length between Sollum, on the west, and El Arish on the east; it is moderately high for some 50 miles eastward of Sollum, and thence to El Arish it is generally low. The boundary between Egypt and Turkey is about 22 miles northeastward of El Arish.

The cultivated portion of the country is confined to the part bordering the River Nile, which is annually inundated or artificially irrigated.

The population by the census of 1907 was 11,287,359, including 286,302 foreigners; Cairo, the capital, having a population of about 654,476.

Government.—Egypt is a British protectorate and is under the rule of the Sultan. There is a British high commissioner for Egypt.

Harbors.—Alexandria and Port Said are the only harbors available for large vessels. Marsa Matruh, about 105 miles eastward of Sollum, is small.

Products.—Egypt produces wheat, barley, maize, rice, beans, sugar, and cotton. Clover, sugar cane, and onions are grown; there is also considerable live stock, including cattle, buffaloes, horses, and mules. Building stone, clays, gypsum, gold, lead, and zinc ores, natron, nitrate of soda, petroleum, phosphate of lime, peridots, turquoise, and salt are produced, and alum, copper ores, emeralds, granite, iron ores, nickel, ochres, ornamental stones, and sulphur are known to exist.

Trade.—The chief imports are testiles, cereals, and vegetables, wood, coal, metals and metal work, chemical products, medicines, spirits, oils, and tobacco, and the exports are mainly cotton and cotton seed, cereals, and vegetables, and cigarettes, ivory, and ostrich feathers.

Digitized by Google

Communications.—Alexandria, Rosetta, Brulos, Damietta, Port Said, Ismailia, and Suez are all connected with each other, and also with Cairo, by railroads. A line of railroad extends from Cairo to Shellal, Wadi Halfa, and Khartum, and there is a branch from Berber to Suakin.

Climate.—In Egypt there are two seasons, summer from April to October, and winter from November to March. The average temperature at Cairo, July and August, is 85°, and in January 54°; at Alexandria 80° and 58°, respectively; and at Port Said 83° and 58°. The climate is uniform, dry, and salubrious.

The temperature of Lower (northern) Egypt is very high in summer, but the nights are cold on the coasts of the delta of the Nile.

Rain seldom falls in Upper (southern) Egypt, but it is not uncommon on the Mediterranean coast in winter.

Karamania is the southern part of the central tableland of Asia Minor. The coast extends from Cape Alupo to Karadash Burnu the northern point of the entrance to the Gulf of Iskanderun, a distance along the coast of some 450 miles.

Harbors.—There are some harbors between Cape Alupo and Cape Khelidonia, available for vessels of any size, and eastward of Cape Khelidonia are many open roadsteads which afford safe anchorage in summer.

Supplies can be obtained at most of the anchorages, but not in a great quantity without notice having been given to the chief of the district or village. Water, though not plentiful in some of the best harbors, can always be taken from the numerous streams.

Sea level.—There is no tidal rise on the coast of Karamania, but southerly and westerly winds raise the water sometimes as much as 2 feet, and northerly and easterly winds lower it similarly, above and below the normal level.

Landing.—On parts of the coast the gravel beach has become a solid petrified mass, and caution is necessary in landing where there is any surf, as the beach appears an ordinary one. The beaches are marked on the charts.

Communication.—There is a railroad from Mersina to Adana, a distance of 36 miles.

Cyprus, an island in the northeastern part of the eastern basin of the Mediterranean, is 123 miles long east-northeast and west-southwest, with a greatest breadth of about 45 miles; its northeastern part is a mountainous peninsula, known as the Karpass, about 37 miles long and from 8 to 2 miles broad. The area is about 3,584 square miles.

Two mountain ranges run generally west and east through the island. The southern range, which is the more extensive and lofty, culminates in Mount Troodos (ancient Mount Olympus), 6,406 feet

Digitized by Google

high, situated about 30 miles east-southeastward of Cape Arnauti, the northwestern extremity of the island. Farther eastward are Mounts Adelphi, 5,305 feet; Papoutsa, 5,124 feet; and Chionia or Machaira, 4,674 feet; and the range ends in the isolated peak, Stavrovouni (the Olympus of Strabo), 2,260 feet, 10 miles westward of Larnaka. The northern range, the western part of which is the Kyrenia Mountains and the eastern part the Karpass Mountains, extends from Cape Kormakiti to Cape Andreas, a distance of nearly 90 miles; its highest point is Buffavento, 3,135 feet.

Messaria or Mesaoria is a broad treeless plain which extends across the island from Morphou Bay to Famagusta Bay, a distance of 50 miles, with a breadth of from 8 to 18 miles. The streams which traverse it are winter torrents, which descend northward from the southern range, but scarcely reach the sea. The Pedicœus and Ialias lose most of their flood waters in the marshes about Salamis; the Pedicœus rises near Machaira and passes close to Nicosia; the Ialias rises a little eastward of the source of the Pedicœus, passes through Nisou, Dali (ancient Idalion), and Pyroi, and traverses the Messaria in directions more or less parallel to the Pedicœus. The Cares (Clarios) which flows from the slopes of Troodos into Morphou Bay, and the Dhiarrizos, which flows into the sea near Kouklia (old Paphos), are smaller but more constant streams.

The island is much subject to drought, although water is said to be plentiful below the surface in the valleys and plains.

The population of the island by the census of 1911 was 274,108, of whom 20.6 per cent were Mohammedans and the remainder mostly members of the Orthodox Greek Church.

Nicosia, near the middle of the island, with a population of 16,052 in 1911, is the capital; there is a Government hospital here. The other principal towns are Larnaka, Limasol, Famagusta, Kyrenia, and Paphos.

Government.—Cyprus forms part of the British Empire, having been annexed to His Majesty's dominions in 1914.

The Government is administered under the colonial office, by a high commissioner. There is a legislative council composed of 18 members, 6 being official and 12 elected, the island being divided into three electoral districts, each returning one Mohammedan and three Christian members. Every inhabitant paying direct taxes has a vote.

For administrative and legal purposes it is divided into six districts. In each district the executive government is represented by a commissioner, and each has a court of law presided over by an English barrister, who is assisted by two native judges, one being a Christian and the other a Mohammedan. There is also a supreme court for the whole island, consisting of two judges.

Digitized by Google

Harbors.—Cyprus possesses no harbors for large vessels, but there is a small port at Famagusta, available for vessels of considerable size, and there are a few anchorages in open bays on the south and southeast coasts; the anchorages at Larnaka and Limasol are safe, even in winter, provided the anchors and cables are efficient.

Products.—Although the island is poorly cultivated, the soil is very fertile. The principal products are grain of various kinds, sesame, linseed, wines and spirits, silk, olives, carobs (locust-tree beans), grapes, raisins, cotton, wool, hides, aniseed, sponges, sumac leaves, terra umbra, asbestos, gypsum, and salt. Cattle, sheep, pigs, goats, poultry, ponies, mules, and donkeys are bred; the mules and donkeys are of excellent quality, and the ponies are very hardy. The best wine is produced on the mountains in the southwestern part of the island, near the town of Limasol, and cotton in the northern part. The bulk of the wine goes to Egypt and the spirits to Turkey.

Trade.—The principal exports are oats, wheat, barley, raisins, pomegranates, carobs, cotton, silk, wine, cattle, donkeys, mules, sheep, and goat skins. The principal imports are wheat flour, wheat, vetches, cotton yarn, cotton piece goods, sugar, tobacco, leather, timber, olive oil, coffee, rice, iron, soap, petroleum, and various manufactured goods.

Communication.—A narrow-gauge railroad extends from Famagusta to Morphou and Evrykhou via Nicosia. The principal towns are connected by carriage roads, and there are daily motor-bus services between Nicosia, Larnaka, and Limasol.

Telegraph.—A British telegraph cable is laid from Larnaka to Alexandria, and land lines connect the six principal towns and also the Government summer quarters on Mount Troodos.

Currency.—The currency of the island is British gold coins, Cyprus silver coins of 18, 9, 4½, and 3 piasters, and bronze coins of 1, a half, and a quarter piaster. The monetary unit is the piaster, of which 180 = £1.

Weights and measures.—One oke = 400 drams; 44 okes = 1 kantar; 800 okes = 1 ton. Two feet = 1 pic; 33 pics = 1 chain; 2,640 pics = 1 mile.

Climate and health.—The climate varies in different parts of the island, but generally during the greater part of the year it is salubrious. The range in temperature is highest on the north and east coasts and lowest on the south and west. The summer heat is very great in the plains, and the British troops, as well as the members of the Government, live on the slopes of Mount Troodos from June to September; here, at an elevation of about 6,000 feet, the climate is excellent; the temperature rarely rises above 70°, and the mountain is covered with snow from December to April. The sanitary condition of the island is good; smallpox is practically nonexistent;

Digitized by Google

diphtheria and enteric fever are not common; cholera and plague have never appeared; dysentery is common among the natives; and Mediterranean fever is almost unknown, but malarial fevers are common; the inhabitants of Famagusta and Larnaka are subject to fever in autumn from the vicinity of marshes, and the natives are similarly liable in all irrigated districts.

Syria, on the eastern shore of the Mediterranean, extends from Asia Minor on the north to Egypt on the south. It is about 360 miles long, with an average breadth of 100 miles.

A range of mountains, split in the north into two parallel chains, Lebanon and Anti Lebanon, fronts the Mediterranean, and attains heights of 6,000 feet in the north, 10,000 feet in the middle parts, and 3,500 feet in the south.

By the Turks and Arabs, Syria is named Belad-esh-Shaon, or "the country to the left," in contradistinction to Belad-el-Yemen, or "the country to the right," as these two regions so appear to the Mohammedan of Mecca, who worships with his face toward the rising sun.

The coast trends generally south-southwestward from the Gulf of Iskanderun, and is lofty and precipitous southward to the vicinity of Sur, whence the mountains become lower and recede from the coast, which is comparatively low southward of Mount Carmel.

Harbors.—Ayas, in the Gulf of Iskanderun, and Beirut Harbor are the only sheltered anchorages for large vessels on the coast. Bierut is an excellent roadstead, but precaution is necessary in winter.

Trade.—The chief productions of Syria are silk, wool, cotton, barley, hides, skins, liquorice root, sesame, wine, oil, tobacco, bitumen, fruit, and sponges, the latter being procured in summer from the localities of Latakiya, Tripoli, Beirut, and Sidon by Greek divers. Cattle and sheep are plentiful and numbers are exported to Egypt.

The principal imports are alcohol, coal, coffee, cotton goods, woolen stuffs, flour, hardware and ironmongery, petroleum, rice, and sugar.

Communication.—A railroad connects Alexandretta with Topakaleh, on the main line to Bagdad. A line connects Tripoli with Homs, on the Aleppo-Beirut line. A line runs from Beirut to Damascus. Beirut is also connected with Aleppo via Rayak. A line runs from Akka to Haifa and from Haifa to Damascus, and Yafa is connected with Jerusalem by railroad. Lines run from Damascus to Mzerib and to Medina; the latter is to be continued to Mecca, a distance of 1,100 miles from Damascus.

There is telegraph communication along the coast by land lines connected with all parts.

Digitized by Google

Digitized by Google

CHAPTER II.

SOUTHEAST COAST OF GREECE FROM CAPE MATAPAN TO SPEZZIA ISLAND, WITH THE ISLANDS OF KITHERA AND ANTIKITHERA.

Mani Peninsula.—The most conspicuous of the mountains from north to south on the Mani Peninsula, which forms the western side of the Gulf of Lakonikos, are Mount St. Elias, or Makryno, ancient *Taygetum*, 7,897 feet high, in latitude 36° 56′ north, its summit being nearly always covered with snow; Mount Mavro, 6,374 feet high, 3½ miles to the southward; Mount Kubenova, 4,827 feet high; Sanghia Mountain, 3,800 feet high; Mount Miniatika, 3,530 feet high; and Mount Kakovuni, 3,000 feet high, the latter being 8½ miles to the northward of Cape Matapan.

In clear weather the lofty mountains may be sighted at a great distance; Mount St. Elias is, however, frequently enveloped in clouds excepting during the dry summer months. With southeasterly winds, the mountains are usually covered with clouds.

Cape Matapan (Tenaron), ancient *Toenarium*, is the termination of a peninsula 3 miles in length, joined to that of Mani on the north by an isthmus only 800 yards in breadth, which separates the little ports of Marmari and Kaio; this peninsula consists almost entirely of dark-gray marble. For 1¾ miles from the extremity of the cape the land rises gradually from southward to northward to a height of 1,025 feet at Matapan Mountain and then falls abruptly toward the isthmus; therefore, when seen from eastward or westward at a distance of 12 miles or more it appears as a triangular or wedge-shaped island. When the distance is so great that the highland of the cape is below the horizon, Mount Miniatika, which is 3,530 feet high, flat topped, and 10 miles northward of the cape, will probably be seen, and its southern slope must not be mistaken for the highland of the cape, which will become visible on a nearer approach.

When immediately southward of the cape its extremity can not be recognized unless the lighthouse can be distinguished, on account of the highland behind it, but on the westward are the steep cliffs of Cape Grosso, forming regular terraces, and to the northeast Kisternes Hill, 344 feet high, rising immediately above Kisternes Point, is conspicuous.

Cape Matapan is steep-to and clear of danger and may be approached within a short distance, there being 80 fathoms ¼ mile from

Digitized by Google

the point. The current in its vicinity generally sets westward nearly 1 knot an hour. When under sail, with strong northerly winds and near the coast, it is necessary to be prepared for the baffling and heavy squalls which blow from the highland.

In fine weather landing may be effected on the eastern side of the cape, immediately under the lighthouse.

Light.—From a masonry lighthouse near the extremity of Cape Matapan and at an elevation of 145 feet above the sea is exhibited a fixed and flashing light, showing a fixed white light with a red flash every two minutes, and visible 16 miles. It is obscured by Kisternes Point. (See Light List.)

Katergaki Rock, 6 feet high, lies close to the shore ½ mile to the northeasward of Cape Matapan.

Gulf of Lakonikos (Kolokithia).—The base of the chain of mountains extending southward from Mount St. Elias together with the peninsula of Mani form the western shore of this gulf, and the base of the chain forming the peninsula of Elos constitutes the eastern shore.

Cape Santa Maria, the southwestern point of the island of Elaphonisos, bears from Cape Matapan 76°, and the entrance to the gulf between the two is 23 miles wide; from thence the gulf extends northward about the same distance, narrowing to about 8 miles off the Helos Plain at its head.

The western shore of the gulf is rugged and irregular. The land at the head consists of alluvial soil brought down by the Iris or Vasilli River (ancient Eurotas), and the lofty mountains of Arcadia are seen at the head of the valley. The peninsula of Elos with its arid and sterile mountains, on the eastern side, fitly correspond with those of Mani on the west. At the northeastern angle of the gulf are the heights of Mount Kurkula, 2,990 feet high and about 2 miles from the shore, the chain continuing southward to Mount Krithina, 2,571 feet above the sea, and terminating 4 miles farther southeastward in Cape Malea or St. Angelo, as it is indifferently called. The principal port in the gulf is Githion, in the northwestern corner. There are no outlying dangers, the water is deep, and the winds are similar to those in the Gulf of Kalamata.

Winds and weather.—Fair weather has been generally experienced between the months of April and August. The wind has been usually from the westward and southwestward during the early part of the summer; setting in daily at about 11 a. m. with considerable strength, especially on the Mani Peninsula, covering the mountain tops with clouds, and usually moderating at night, but occasionally continuing without a break for 3 or 4 days, reaching home to the eastern shore and causing a considerable sea. These winds are generally accompanied by a haze.

Digitized by Google

Easterly and northeasterly winds seldom prevailed on the western side, but frequently occurred during the day on the eastern shore of the gulf. On one occasion in the middle of April a strong and steady gale from the northeastward, lasting 36 hours, accompanied by thick haze, set in without warning from the barometer, which remained high and steady throughout.

Southerly winds never blew with any violence, and seldom reached the head of the gulf. Their presence in the offing was apparent from the long swell setting in from that direction.

Light northerly winds, refreshing in their coolness, accompanied by a very clear atmosphere, rendering the distant lofty mountains clearly visible, occurred at rare intervals. Rain only fell on three occasions in a period of five months. The almost entire absence of clouds throughout the day and night was a marked feature, which as midsummer approached caused this treeless and stony coast to become much dried up and superheated. Caution is necessary, therefore, in exposing oneself to the sun, and the use of a sun helmet is always necessary during the summer months.

Fogs seldom occurred and do not last long. As a rule they only formed in the morning calms, before the heat of the day commences.

Port Asomato.—Kisternes Point, 1¼ miles northeastward of Cape Matapan, is a well-defined point separating the two little bays known as Ports Asomato and Vathy. Kisternes Hill, 344 feet high, is a sharp rounded summit near the point. On it once stood a fine temple dedicated to Neptune.

The entrance to Port Asomato is less than 1 mile northward of Cape Matapan; it is about 400 yards wide at the entrance and recedes 600 yards, having three little bights at its head. The depths are from 10 to 17 fathoms in the middle, with 3 or 4 fathoms close to the shore on either side, but toward the head it shoals more gradually. It affords good shelter from all winds except those from between south and southeast, and the hills around this port not being so high as those about Port Vathy, it is not subject to such heavy squalls as the latter. There is a small village about 700 yards from the head of the bay and a marble quarry beyond it; the marble blocks are transported down to the port on rough timber railroad, and there embarked.

Port Vathy is inferior to Port Asomato, for, though well protected from seaward by Kisternes Point, it is very narrow, the water deep, and it is subject to heavy squalls from all directions. The anchorage in 11 fathoms at the head of the harbor is fair, but as it is only about 130 yards wide, a vessel of any size must either moor very taut or head and stern.

Port Kaio (ancient Psamatus), 3 miles northward of Cape Matapan, is open to the eastward, and 500 yards wide at the entrance.

Digitized by Google

The head of the port is separated from Port Marmari, on the western side of Matapan Peninsula, by the narrow isthmus before mentioned, and on a hill on the western side of the port is an old tower or castle 445 feet high. The point on the northern side of the entrance is broad and of a reddish color, and the port may be known at a distance by the break in the land at the isthmus.

This port is superior to either Ports Asomato or Vathy, although the anchorage is much confined by the extensive Harbor Shoal.

Harbor Shoal is an extensive rocky shoal about 300 yards long in a southwesterly direction and less than 100 yards broad, with general depths of 7 to 9 fathoms and deep water all round. It lies in the center of the port, and on it are two rocky heads.

The outer of these, with a depth of 4 fathoms, lies in the way of vessels entering the port; from it Entrance Point bears 136°, 320 yards distant.

The inner rock, with a depth of only 2 fathoms, lies 195 yards 231° from the outer rock, with Entrance Point bearing 105°, 390 yards. These shoal heads, which are steep-to, can generally be distinguished in daytime by the appearance of the water over them.

The extremity of the land to the southward, seen open eastward of Entrance Point, bearing 150°, clears the Harbor Shoal to the eastward.

Light.—A fixed white light is occasionally shown from Entrance Point when a steamer is expected at night. (See Light List.)

Directions.—No special directions can be given for the avoidance of these dangers when using the port; the chart should serve as the best guide.

If intending to anchor in the southwestern part of the bay, when coming from the southward, Entrance Point can be rounded at a distance of about 100 yards, anchoring when the house on the beach in the eastern corner of the sandy bay, forming the southern bight, becomes visible.

Anchorage.—The best anchorage is in the southern bight of the port in about 17 fathoms, protected from easterly winds, where it would be necessary for all but a small vessel to moor; anchorage can also be found northward of the Harbor Shoal, where the water is deeper.

Communication.—It is a regular port of call for the weekly coasting steamers to and from the Peiræus; there is a small coasting trade here.

Supplies.—No supplies can be obtained here. A few houses are scattered around the shores of the bay, the most conspicuous being the buildings of a former monastery on the northern shore.

The village of Port Kaio, which is somewhat hidden from the anchorage, is situated on a hill 500 feet high to the southward. The inhabitants of this wild mountainous district obtain a scanty liveli-

Digitized by Google

hood from their flocks and a little corn and fruit which they are able to cultivate in carefully prepared terraces on the rocky mountain slopes.

Coast.—The coast northward of Port Kaio is high and rugged to Demaristika Point, the mountains descending abruptly to the shore line, which is steep-to, depths of 100 fathoms being reached within 400 yards off it.

There is a small cove fit only for small craft about 1½ miles northward of Port Kaio.

At Demaristika Point the coast trends to the north-northwestward for 2½ miles, and then to Kolokithia Bay, 11 miles from Port Kaio. The mountain ranges of Kakovuni and Sanghia, 2 miles inland, are here plainly seen, as also the scattered villages perched on their lower slopes with their many towers, a common feature of all the houses on the western side of the gulf.

There are a few indentations, used only by coasters, deep water being found close inshore. Port Nimphi, formed by a narrow cleft, may be considered the most important.

Kolokithia Bay is 11 miles northward of Port Kaio, the coast between being high, rugged, and barren, and the water deep close inshore. The bay, 1½ miles wide, is open to the southeastward, falls back between high land, 1 mile northwestward, and, being much exposed, should not be resorted to unless in case of necessity. A bluff promontory projecting in a southeasterly direction forms its northeastern side, and the water in the center of the bay is deep. The termination of the promontory takes the name of the bay, and about 600 yards southward of it is a shoal with 4 fathoms water. It is not a good anchorage, being exposed and surrounded by high mountains, from which brief squalls frequently descend. The best anchorage is in the northeastern bight, with the extremity of the promontory of land in the center of the bay, bearing 287°, 700 yards, the squalls from the Sanghia Mountains to the westward being less severely felt here.

The little town of Kotronas is in the northeastern angle of Kolokithia Bay.

Caution.—The squalls down the mountain slopes all along the eastern side of the Mani Peninsula are especially severe, rendering it dangerous for boats.

During the summer months the sea breeze, from the westward, generally sets in by 11 a. m. and lasts till past sunset; its advent is frequently made known by the mountain tops becoming covered with clouds.

There are several villages here and also up the valley to the northwestward, formed by a break in the mountain range, which leads to the Pass of Dhikora.

Digitized by Google

Port Skutari, northward of Kolokithia Bay and separated from it by the bluff reddish promontory just mentioned which terminates eastward in Cape Stavri, affords the best anchorage in the gulf. The entrance is open to the southeast and more than 1 mile wide; thence the bay recedes northwestward 2¼ miles to the head, where there is a sandy beach. It is well sheltered from all winds except those from southeast, to which, however, it is entirely open, and as the bottom is mud it is considered a secure anchorage.

Cape Pagania is the southeastern extremity of the promontory forming the northeastern side of Port Skutari, which promontory is a nearly flat table land, 520 feet high; the cape itself is round, bold, and 393 feet high. At the entrance of the port between the two capes there are 60 fathoms water, which decreases to 20 fathoms at ¾ mile from its head, and at ¼ mile from the beach there are 7 fathoms, mud.

The anchorage affording the best shelter is in the northwest corner, in 11 fathoms, with Refuge Bluff bearing 190° distant 1,200 yards, and the chapel on Skutari Hill bearing 323°. Squalls from the high mountain slopes from the westward are less severely felt here.

Pagania Rock, with 5 fathoms least water and 8 fathoms round it, lies on a rocky ledge which extends in a southeasterly direction for 400 yards from Cape Pagania. When coming from the northward the cape should not be rounded nearer than ½ mile.

Skutari Town is on the slope of a hill at the head of the port. There is no water to be obtained. The country of Mani, inland, though rugged, grows sufficient barley and beans to support its inhabitants, and silk is an article of export.

Coast.—From Cape Pagania the coast trends 1 mile in a northerly direction to Cape Kremidara and then recedes to the westward, forming a semicircular bay 4 miles wide. This bay has an irregular coast line and affords no shelter. A road through a deep and tortuous gully in the mountains leads to the town of Tsimova, near Port Limeni, in the Gulf of Kalamata.

Mavrovuni Point is steep-to and may be approached within ¼ mile. Off its southern extremity is a rock 2 feet high almost connected to the shore, and on which the sea nearly always breaks. The village of Mavrovuni, on rising ground above the point, is conspicuous from all directions.

Githion (Gythium), the port of Sparta, stands on the coast at the foot of a hill 6 miles northward of Cape Pagania; the population is about 4,000, and it is the principal seaport of the district, of which Sparta, about 25 miles distant to the northward, is the capital. It is sheltered from southerly winds and sea by Cranæ Islet, about ¼ mile in length east and west, which is itself connected by a causeway

Digitized by Google

with the shore 200 yards distant; on the islet is a small church built in the form of an ancient temple.

On a hill northward of the present town are vestiges of the ancient town, and about 1½ miles to the northward, on a hill near the shore, are the ruins of the castle of Kaki Skala.

Trade.—The imports consist mainly of grain, cloths and cotton stuffs, building materials, and timber.

Communication.—There is communication by steamer about three times a week between Githion and Athens, Patras, and certain intermediate ports; and there is telegraphic communication with the European system.

The Deutsch Levante steamers call here monthly on their passage from Batum to Hamburg.

Mails arrive daily from Athens and Europe, overland via Sparta.

Supplies of fresh provisions can be obtained here with a little notice beforehand and fresh water suitable for boilers only, from a stream running into the sea ¾ mile northward of the town between a break in the earth cliffs. Fruit is plentiful in the season.

Anchorage.—The best anchorage is in about 17 fathoms 600 yards northward of Cranæ Islet, off the northern end of the mole head forming the inner harbor, alongside which small coasters unload. Small vessels may anchor closer to Cranæ Islet. Easterly winds cause a nasty sea in the roadstead. The water deepens suddenly off the coast bank, and attention to this is necessary. Cranæ Islet may be rounded closely.

Light.—From an octagonal white lighthouse, 76 feet high, on Cranæ Islet is exhibited, at an elevation of 89 feet above the sea, a fixed and flashing light, showing white fixed with alternately a white and a red flash; it is visible 15 miles. (See Light List.)

Directions.—Githion or Marathonisi being in the northwestern part of the Gulf of Kolokithia, a vessel bound to that anchorage should be guided by the truncated peak of Xyli, conspicuous on the eastern side of the gulf; while the two promontories of Capes Stavri and Pagania will be recognized on the western side, the former being the higher of the two, farther northward Mavrovuni Point, sometimes called Monte Nero, 1 mile southward of the town, and which has on it a village, will appear of a reddish color. Cranæ Islet should be given a berth of 200 yards in passing, and a vessel should then anchor as already directed. In approaching the anchorage and the coast northward of it, do not stand close in without attention to the lead, on account of the shallow coast bank, which abreast of the anchorage extends 1.7 miles from the shore. When coming from Elaphonisos Channel, Mount St. Elias is nearly in line over the anchorage.

Digitized by Google

Coast.—The coast northward of Githion trends to the northeastward past the cliffy point 1½ miles from the town, above which are the ruins of the castle of Kaki Skala.

Trinisi are three small black islets or rocks, 2½ miles northeastward of Githion; the outer islet lies 700 yards from the shore, with which and with each other they are connected by shallow water, sheltering an anchorage inshore of them very useful to coasting vessels.

Iris or Vasilli River (ancient *Eurotas*).—From near Trinisi the low marshy shore forming the head of the Gulf of Kolokithia trends eastward 8 miles to the base of Mount Kurkula. The Iris River runs through the valley into the sea by several mouths, the principal being about 3 miles eastward of the Trinisi; there is but little water on the bar, but within it is navigable some miles for flat-bottomed boats. The valley in the interior is richly cultivated. The shore along the head of the gulf should not be approached within 1 mile, and attention should be given to the lead.

Mount Kurkula stands at the northeastern angle of the gulf, where the low shore terminates. It is round topped, 2,990 feet above the sea, and is easily distinguished.

The Twin Peaks form a prominent object 1 mile southward of it and 2 miles from the shore line; the southern peak is the highest, and is 2,561 feet high. From the Twin Peaks this range rapidly falls to the southward in low flat hills to the plain of Phiniki.

Coast.—The coast at the termination of the sand beach trends to the southward for about 9 miles to Cape Xyli; it is composed of earth cliffs and sand beaches with scattered rocks close inshore, but is clear of all dangers at a short distance off the shore.

Kokina Tower stands on the edge of a cliff near the head of the gulf and is difficult to distinguish until close-to.

Elea.—A small seaport of rising importance is easily distinguished by the conspicuous tower standing on the edge of the cliff, 135 feet high, on Mulaos Point, with an off-lying islet 40 feet high beneath it. When approaching from the westward the houses of the town will also be seen; it is the principal seaport of this district.

Mulaos Point—Light.—A fixed red light, visible 6 miles, is erected on the head of mole on eastern side of Mulaos Point; it is shown at an elevation of 30 feet, on an iron column, on a masonry base with sheet-iron cabin close by.

Communication.—A steamer calls weekly from the Piræus.

Supplies may be obtained from Mulaos, a village situated on the eastern slopes of Mount Kurkula, about 6 miles distant from the port by a good road.

Anchorage.—As the anchorage is exposed and the depths somewhat irregular, vessels should anchor northwestward of the town in

Digitized by Google

not less than 12 fathoms, taking care to avoid the shallow spit that extends from the low sandy point northward of the settlement. In 1902 it was contemplated to improve the anchorage for the coasting craft by building a breakwater.

Phiniki Plain is well cultivated, with numerous villages extending across the Elos Peninsula to Monemvasia; it is occasionally partly flooded during the winter.

Xyli Bay is open to the southward, and is included between the two converging Capes Xyli and Arkhangelo, which are 2¾ miles apart; the whole bay thus formed is again divided into two inner bays, viz, Xyli Bay on the northern and Arkhangelo Bay on the southeastern side, each point thus covering a separate anchorage.

The northern anchorage is sheltered on the western side by a promontory projecting 2 miles southward, with Xyli Peak rising to a height of 1,056 feet near its center. When seen from the southward the mount appears like an island in the form of a truncated cone, and at a distance of 12 miles the white rocks on its summit seem almost like the ruins of a castle, but when viewed from the westward its appearance is changed; the land southward of it is comparatively low, ending at Cape Xyli with a round head like an islet joined by an isthmus to the base of the mount.

Port Arasma.—The head of Xyli Bay is called Port Arasma, and is bordered by rocky shallow water, the depth of 5 fathoms being nearly ¼ mile from the shore. Here a mountain stream with but little water runs into the sea. A lane of deep water runs into the bay at the entrance; in entering give Cape Xyli a fair berth, steer in and anchor on the western shore with the mount bearing about 265° in from 18 to 12 fathoms, sand. The rugged summit of Mount Kimatisa less than 2 miles back from the northeastern shore of the bay, is 1,715 feet in height; the base of this mountain, with the highland southward of it, forms the eastern shore, which is skirted all round by rocks and shallow water, and should be given a wide berth.

About 1 mile inland from the northeastern shore is a remarkable flat-topped pillar rock 1,015 feet high with steep sides, accessible only from the land side, known as the Acropolis. It is a natural stronghold, and on it will be found the ruins of a chapel and the remains of former buildings.

Vestiges of the ancient town of Blitra, now submerged, can be seen beneath the water, off the low shallow point on the northeastern side of the bay.

Trade.—There is little trade here, the port of Elea absorbing it all.

Arkhangelo Bay, about 4 miles from Port Arasma, is semicircular, about ¾ mile wide, and open to the northwestward; it is sheltered from southwesterly winds by Cape Arkhangelo, a tongue of

Digitized by Google

land with a hill on its extremity projecting about ½ mile northwestward. A little church and some houses serve to mark a cove at the head of the bay, fit for small coasting craft. Mount Astratigos, 1,400 feet high, rises from the eastern shore of the bay. The water is deep, there being 18 fathoms about 400 yards from the shore; from this it shoals very quickly to 5 fathoms at the edge of the rocky coast bank.

During heavy rains several streams discharge themselves into the sea between Port Arasma and Arkhangelo Bay, but in summer they are usually dry.

Coast.—From Cape Arkhangelo the coast continues southeastward for 8 miles to the entrance of the narrow channel between Elaphonisos Island and the main. At 1.6 miles from the cape is the bluff point of Lyriotiki with a round tower on it, and between them are three little rocky islets near the shore, with shallow water extending off about 600 yards; farther southward are the Klaro Islets, northeastward of which coasters find shelter. At 3 miles southeastward of the islets is the small projecting point of Kulendi with a tower on it; the shore then becomes lower, and 3 miles farther southeastward is the channel separating Elaphonisos Island from the mainland.

Anchorage in 12 fathoms of water may be obtained ¾ mile to the northward of Kulendi Point at ½ mile from the shore.

Elaphonisos (Cervi) Island is triangular in form with a deep bay on its southern side, each side of the island measuring about 3 miles; the hills are of moderate height, that in the center being 906 feet high. It is barren, uncultivated, and destitute of water. The northwestern side of the island is sinuous and bordered by shallow ground extending in places ½ mile from the shore, and on which are several islets and rocks named Poriki; this side of the island should not be approached too closely.

Saraceniko Bay.—The southern side of Elaphonisos Island between Cape Santa Maria, the southwestern point, and Phrango Point, the southeastern, forms the semicircular bay of Saraceniko, about 1 mile deep. The head of the bay is shallow, and on the eastern side of it is the round projecting headland of Point Helena, having the appearance of an island, but which is connected with the shore northeastward of it by a low sandy neck. A vessel requiring immediate shelter from northerly or northeasterly winds may anchor here off the beach in from 8 to 15 fathoms water, but the holding ground is uncertain and Vatika Bay is a better anchorage.

Cape Santa Maria should not be rounded too closely, as a shoal extends 200 yards from it. Phrango Point is cliffy, clear of danger, steep-to, and may be approached at discretion, but Point Helena is bordered by a shoal extending more than 100 yards from the shore;

Digitized by Google

between the two is the little bay of Phrango. From Phrango Point the eastern coast of the island is irregular and trends northward nearly 3½ miles, terminating in a low tongue.

A small bay known as Lephki, which lies 1½ miles northward of Phrango Point, has been found to be a useful and convenient anchorage with strong westerly and southwesterly winds, when the anchorages in Saraceniko Bay and Vatika Bays were undesirable.

The northern end of Elaphonisos Island is low, sandy with rocky projections, and surrounded by shallow water; it is separated from Petri Isle and the sandy point of the mainland on the north (which are also bordered by shoals) by a tortuous channel about 100 yards in width, carrying about 6 feet water and only fit for boats. The current sets strongly through this channel. Elaphonisos was once connected with the mainland, the channel which now separates it being then an isthmus.

Vatika Bay (ancient *Sinus Beaticus*), between Elaphonisos Island on the west and the coast of the Morea, distant 3½ miles on the east, is open to the southward, about 4½ miles deep, and semicircular at its head; it is surrounded by an amphitheater of hills, the most lofty peak to the northward being Mount Aspro, 2,180 feet high, between the foot of which and the low swampy shore at the head of the bay is cultivated land, while on the west a chain of heights extends southward to the sea. The bay is frequented by vessels bound either eastward or westward and encountering strong adverse winds; with southerly winds a heavy sea sets in, but they always give sufficient warning of their approach to enable vessels to clear the bay.

Petri Isle, in the northwestern angle of the bay and on the northern side of the entrance to the boat channel between Elaphonisos Island and the main, contains many specimens of petrifactions of small branches of trees and oyster shells, in every stage of change from the original state to solid stone. There is a village on the site of an ancient town on the eastern shore of the bay, but little in the shape of fresh provisions can be procured. The town of Gliki, the largest near the shores of the bay, will be seen halfway up the mountain. The swampy plain at the head abounds with hares.

The eastern shore of Vatika Bay is irregular and bordered by rocks and shoals; in passing near St. Elia, the eastern entrance point of the bay, the white sandy bottom with black rocks can at times be distinguished.

Niapolis, the principal town in the neighborhood, lies on the northeastern shore of the bay, and is of rising importance. It is a telegraph station and port of call for steamers weekly from the Peiræus, Zante, and certain intermediate ports. A fair supply of fresh provisions can generally be obtained.

Digitized by Google

Anchorage.—Vessels anchor as convenient off Niapolis in about 15 fathoms or at the head of Vatika Bay, and in easterly or north-easterly winds a good berth may be obtained a little more than ½ mile from the shore in 10 or 12 fathoms, sandy bottom. The bottom on the eastern side of the bay is uncertain, being rocky in places.

In a westerly or southwesterly gale, or even with the wind at south-southwest, it is stated by local seamen that the best anchorage is about ¼ mile eastward of Petri Isle, where indeed they consider a vessel to be safe in any wind, the sea forced through the channel between Elaphonisos and the main being here met by the current setting in the opposite direction, which reduces its effect to a swell only; consequently vessels in this position are said to ride easily at their anchors, for, although squalls may reach the vessels, the cables have no undue strain on them; eastward of this anchorage the sea breaks heavily.

Directions.—Vessels may round Cape Malea at any convenient distance, as the water is deep close inshore, but it is advisable with northerly or northeasterly winds, when under sail, to give it a fair berth in order to avoid the light winds, calms, and heavy squalls which occur under the highland. At night the fixed and flashing light on Cape Spathi, the northern end of Kithera, is a good guide through the Elaphonisos Channel. There is no danger in entering Vatika Bay, as the shore on either side may be approached to the distance of ½ mile.

In bad weather, or before a northerly gale, Mount Krithina, 2,571 feet high and 4 miles northwestward of Cape Malea, is always shrouded by dense masses of clouds which whirl and roll down the sides of the mountain with great velocity; the wind follows quickly and with great force. Vessels, therefore, having to bear up from the archipelago, especially at night, should be under easy sail to enable them to beat into Vatika Bay without having to shorten sail to the squalls from the highland.

In rounding the cape from the westward with the wind northward of west, in all probability a northerly or northeasterly wind will be found blowing in the archipelago.

Coast.—Half a mile southeastward of St. Elia Point is St. Elia Rock, surrounded by shallow water extending 400 yards from the shore, and 1 mile eastward of it is the little chapel of St. Elia; thence the high coast trends southeastward nearly 1 mile to Zobolo Point, 3⅓ miles westward of Cape Malea. Between these headlands the high coast recedes northward, forming a bight about 1,400 yards deep.

Zobolo (Zovollo) Point—Intended light.—A flashing light showing alternate red and white flashes, visible 19 miles, will be established (1914) on Zobolo (Zovollo) Point.

Digitized by Google

Cape Malea or St. Angelo, the southeastern extremity of the Morea, is the termination of the Elos Peninsula, and is a high, bold, round headland, rising from deep water to a height of about 1,970 feet; it is clear of danger, steep-to, with from 25 to 30 fathoms not far from it.

Light.—At 42 yards within the northeastern extremity of the land, and rather more than 1 mile northward of Cape Malea, is exhibited from a square lighthouse 49 feet high, at an elevation of 131 feet above the sea, a fixed white light, visible 17 miles. The light is partly obscured. (See Light List.)

Vessels coming from the westward will not, therefore, open out this light until the southern extremity of Cape Malea is abaft the beam.

Current.—The current in the vicinity of Cape Malea generally sets westward about 1 knot an hour, but its strength and direction vary with the wind. Sailing vessels entering the archipelago should not close the land near the cape with the view of avoiding the current, as the chance of a steady breeze is more favorable in the offing.

Kithera Island is of an irregular oval form, about 16 miles in length north and south, 10 miles in extreme breadth, and has an area of about 80 square miles. It is mountainous, arid, and of volcanic formation, the greatest elevation being on the western side, where Mount Kithera attains a height of 1,668 feet, while on the eastern side Makri Hill is only 63 feet less. There are several caves, of which the two principal are the beautiful stalactite grottoes of Santa Sophia and Mylopotamo; the caves are noted for porphyry. The coasts of the island are high, scarped, with small off-lying islets here and there, surrounded by deep water, and the western and southwestern sides are irregular, with precipitous cliffs.

The climate is temperate and healthful, but the island is liable to violent whirlwinds which often cause considerable destruction to vegetation, destroying trees and vineyards. Sheep and goats find pasture in the mountains; the produce of the valleys are grapes, wine, oil, melons, figs, fruit, hemp, cotton, and honey, all of which are exported. Cereals are grown for home consumption, great numbers of hares, rabbits, and turtledoves are caught, and in autumn quantities of quails and other birds. The fisheries are productive and form a large item in the commerce of the island. The population of Kithera Island is about 12,000. The principal town is Cerigo, Tzerigo, or Kithera, near Kapsali Bay, at the southern end of the island; another town and port is St. Nikolo, on the southeastern side. Potamo, the principal town in the northern part of the island, is connected by telegraph with the mainland. The roads are generally good and lead through the different districts.

Digitized by Google

Cape Spathi, 4½ miles southward of Elaphonisos Island, consists of salient steep cliffs, 328 feet high, level on the summit, but gradually increasing in height to the southward.

Rock.—Close off the extremity of the cape is a rock with 3 fathoms on it, surrounded by deep water; this is the only off-lying danger, and the cape may be passed at a distance of ½ mile.

Landing.—During northeasterly winds, when landing is impossible at Santa Panaghia, passengers and goods for the northern district are landed at the cave on the western side of Cape Spathi; care must be taken to avoid the rock nearly awash which is right off it and upward of 400 yards from the shore.

Light.—On Cape Spathi, 570 yards within its northern extremity, is a circular stone tower 82 feet high, which exhibits, at an elevation of 362 feet above the sea, a fixed white light, visible 20 miles; beyond a distance of 12 miles the flashes only are visible. The light is partly obscured. (See Light List.)

Cape Karavugia.—At 1¾ miles westward of Cape Spathi is Cape Karavugia, with a low level black islet northward of it, 7 feet high and surrounded by shoal rocky ground.

West coast.—The western coast of Kithera is high, sinuous, and clear of off-lying hidden dangers; small islets lie here and there at from ½ mile to 1 mile from the land, but the water near them is deep. Vessels lying-to under the lee of the island during strong northeasterly winds should be under easy sail, as heavy whirling squalls often blow from the highland.

From Cape Karavugia the coast southward is bold and steep, skirted by straggling rocks, landing being difficult.

Platanos Rock, 32 feet high, is situated off the point of land forming the northern extremity of Pallikari Bay; it appears as a well-defined conical rock when viewed from the northward and southward.

Pallikari Bay, which is free from danger, affords a temporary anchorage only, and should be quitted at once on the approach of a westerly wind, which creates a turbulent sea all along this coast.

Cape Ruphugialos is the northern termination of the remarkable perpendicular dark cliffs, which attain a height of 800 feet and have a sheer descent to the sea, situated 1 mile northward of Phana Kopia Bay. Off the cape is an islet 38 feet high, and immediately southward of it an extensive ravine forms a break in the cliffs, with a shingle beach at the head of the inlet. A rocky islet, 30 feet high, lies on the northern side of the entrance.

Axini Islets are two small rocky islets. The northern one, about 1½ miles 206° from Cape Ruphugialos, appears as a low rocky ledge, 22 feet high; the southern islet, 36 feet high, 1,200 yards 152° from the northern islet, is close inshore. Foul ground extend for nearly

Digitized by Google

¼ mile to the northwestward of this latter islet, and there is also a rock, on which the sea nearly always breaks, ¼ mile 287° from it.

There is a narrow passage between the Axini Islets with uneven depths, but it is not recommended.

Phana Kopia Bay, to the eastward of the Axini Islets, affords the only anchorage hereabouts; it is moderately protected from the westward, but the backwash, caused by the swell striking the cliffs to the northward, creates a confused sea, and there is generally a swell.

Anchorage.—On coming from the northward the best guide to the anchorage is to pass Cape Ruphugialos at a distance of about ½ mile, anchoring in 16 fathoms before South Axini Islet is shut in by the point of land extending to the northward, which forms the western arm of the bay. Platanos Rock will be seen open of the land southward of Cape Ruphugialos as a further guide. If coming from the southward, North Axini Islet may be rounded closely to the northward.

The slopes of Mount Kithera, 1,668 feet high (the highest part of the island), descend abruptly to the southern shores of the bay, and landing is difficult except during fine weather. A good path leads to the village of Mitata, which is not visible from the sea.

Lindo Islet, 3½ miles southward of the Northern Axini Islet and ½ mile from the shore, is 92 feet high, with its low northern part nearly insulated at about one-third its length, and off its southern and western sides are small detached rocks.

The coast hence to Kapsali Bay is high, bold, and cliffy, with numerous caves, and about 2 miles from the bay is a cove and landing place named Melidoni Bay, exposed to the southward.

Strongilo Islets are two rocky islets, 600 yards apart, about 1¼ miles southward of Lindo Islet; the southern one is 110 feet high and the northern 10 feet less. Detached and sunken rocks exist between them.

Caution.—Lindo and Strongilo Islets lie in the track of vessels navigating between Kapsali and Githion. Being comparatively small and low, they are difficult to make out under the highland, especially at night, and a wide berth should be given them. The features of the coast are not very decided, and it is therefore not easy to fix the position of a vessel when Ovo Island is invisible.

Grunia Rocks, 2½ miles southeastward of the Strongilo Islets and near the eastern point of Melidoni Bay, are two rocks 5 or 6 feet above water with a patch of sunken rocks ¼ mile eastward of them. Grunia Rocks are 1½ miles northwestward of Cape Trakhili, the western entrance point of Kapsali Bay.

Kapsali Bay, at the southern end of Kithera, is semicircular, about 1,400 yards wide, open to the southward, and falls back 1,400

Digitized by Google

yards to the northward. In the northeastern part of the bay a little promontory, on which is a small white lighthouse, separates two little coves. The eastern cove, near the shore of which is the lazaretto, is circular, shallow, and rocky, and its entrance only 55 yards wide; the other is much larger and used by coasting vessels.

Mount Kapsali northwestward of the bay is flat topped and 1,574 feet high, with a conspicuous monastery on its northwestern extremity, from which the mountain descends abruptly in steep, rocky terraces to the shore line; Kentdivi Hill, immediately northward of the bay, circular in form, with a white house on its summit, rises to a height of 1,088 feet above the sea.

Cape Trakhili (Trakhylion), on the western side of the entrance, is the termination of a tongue of cliffy land projecting southward and then southeastward, thus forming an arm which shelters the bay from southwesterly winds and sea.

Cape Grosso, the name of which expresses its appearance, is the eastern entrance point. The land around Kapsali Bay is high, with a slightly irregular shore and a shingle beach at his head. The water is everywhere deep, and from 25 fathoms in mid-channel at the entrance it decreases gradually in depth to the head of the bay.

Light.—On the western part of the little promontory, at the head of Kapsali Bay, is a white turret 19 feet high, from which, at an elevation of 82 feet above the sea, is exhibited a fixed red light, visible 8 miles. The light is obscured when in range with Ovo Islet. (See Light List.)

The town of Cerigo (Kithera) is on a hill near the northwestern side of the bay, and has a population of about 1,500. In front of the town is a large Venetian fortress, about 590 feet above the sea, which commands the town and bay and is conspicuous from seaward.

Communication.—There is weekly communication with the Piræus and certain intermediate ports.

The Austrian Lloyds steamers call here fortnightly on the outward passage from Trieste to Constantinople, connecting with the principal Greek and Turkish ports.

The town is in telegraphic communication with the general European system.

Port regulations.—The island of Kithera has its own jurisdiction, and is treated as a separate dependency by the Hellenic Government; the usual port and quarantine regulations should be observed.

Aspect.—From the westward the town appears perched on the hill, and a white mill on Cape Grosso, the only building in that vicinity, can not be mistaken.

Anchorage.—The best anchorage is 400 yards 197° from the lighthouse, in 16 fathoms, mud and sand. Small vessels moor under

Digitized by Google

cover of the lighthouse point and opposite the village of Kapsali. There are 4 fathoms near the point and the water shoals gradually to the beach. The anchorage is safe with all offshore winds, but it is exposed to those from the southward and southeastward which send in a heavy sea, and, although the bottom is mud and sand, the anchors do not hold; consequently it is not safe except under favorable circumstances. The squalls from the hills are often violent.

Ovo Islet (ancient *Epla*) is about 1,200 yards in length north and south, 647 feet high, and its bare rounded surface appears, as its name implies, like a large egg. The islet is steep-to, the water around it being very deep; it lies 2 miles southward of Kapsali Bay, and serves as a mark for that anchorage.

Cape Kapela, 2 miles eastward of Cape Grosso of Kapsali Bay, is the southeastern extremity of Kithera; the high steep coast, rising about 300 feet above the sea and skirted by rocks, thence trends northward for 5½ miles to St. Nikolo Bay.

Kupho Islets are two small rocky islets, the larger of which is 33 feet high, flat, about 200 yards in diameter, and lies 2¼ miles 101° 30′ from Cape Kapela; the smaller islet bears 155°, 800 yards from the larger, and 400 yards off its southern side is a rock with 1½ fathoms water. With the exception of this 1½-fathom rock, the Kupho Islets are clear, the water around them deep, and in case of necessity a vessel with a commanding breeze may pass between them, where there are 50 fathoms; during foggy weather or calms caution is necessary, as the currents are strong and irregular.

St. Nikolo Bay.—At 5½ miles from Cape Kapela the coast turns and trends eastward for about 1½ miles to Mothoni Point, forming St. Nikolo Bay, which is ½ mile deep and open to the southward and southeastward. There is anchorage here with all offshore winds; but being exposed to those from southeast vessels roll heavily, and wrecks have taken place when surprised by wind from that quarter.

On the northern shore of the bay is a castle or fortress near the entrance to Port St. Nikolo.

Mothoni Point is low, shelving, and surrounded by rocks at the distance of 200 yards; from the point the land rises gradually northward to Mount St. Georgio, 1,248 feet high, with a small church near its summit. The mount slopes rapidly on its western side, and about halfway down is a counterscarp of reddish earth.

Westward of the castle the shore is beach and steep cliffs with scattered rocks, and here are the ruins of the ancient town of Kythera, ancient tombs, and other remains.

The anchorage is about 800 yards southwestward of the castle, in 17 fathoms, sand and mud; here Dragonera Islet is shut in by Mothoni Point.

Digitized by Google

Port St. Nikolo.—On the eastern side of the castle is an inlet open to the southwestward, 300 yards deep, 100 yards wide at the entrance, where there are 6 fathoms water, widening within, and forming an excellent little basin with 4 fathoms. Here vessels moor in safety, and the port is the best in the island. The village is on the northwestern side of the port and a good road leads to the town of Cerigo (already mentioned), about 10 miles distant, or two hours' drive.

Intended light.—A fixed red light, visible 5 miles, will be established at Port St. Nikolo (1913).

Communication.—Steamers call at Port St. Nikolo.

Directions.—Vessels entering St. Nikolo Bay are generally from the archipelago. After having made Cape Malea and Makri Hill, 1,605 feet high, the highest summit on the eastern side of the island, Mount St. Georgio, a short distance southeastward of it, will be sighted, and on nearing the port the Dragonera Islets, which should be left on the starboard hand. Mothoni Point should not be rounded nearer than 300 or 400 yards, when anchor as before directed.

Dragonera Islets.—Dragonera, the southernmost and larger of the two, is nearly oval in form, about 1,250 yards in length east-southeast and west-northwest, and 120 feet high. Near its eastern extremity, is a rock above water and shoal ground beyond it; here the sea breaks heavily with northeasterly winds. The islet is 700 yards from the nearest part of Mothoni Point and is connected with the mainland northwestward of the islet by a bar with 3 and 4 fathoms water over it, the latter depth being nearly in mid-channel.

Anti Dragonera, 800 yards northward of Dragonera, lies parallel with it and is somewhat smaller, being only ½ mile in length and 93 feet high; it is clear on all sides and separated from the mainland by a channel 400 yards wide with 13 fathoms water, which may always be used by keeping nearest to the islet in order to avoid the rocky point of the mainland abreast of it.

These islets are covered with scanty grass and low scrub, affording pasturage for a few sheep and goats, but there is no water. From the eastward Dragonera Islet is first seen; on a near approach the appearances of the two are very similar, both having a fall in the middle, producing two hummocks.

Anchorage.—There is temporary anchorage for small vessels between the two islets in from 11 to 20 fathoms water, with the advantage of three passages for leaving.

Northeast coast.—From the Dragonera Islets the northeastern coast of Kithera trends in a northwesterly direction nearly straight to Cape Spathi, a distance of 11½ miles; it is generally high with a few sandy spots, has no off-lying dangers, and the water all along is deep.

Digitized by Google

Makri Islet.—The Islet of Makri, about 2 miles northwestward of Anti Dragonera, 95 feet high and 1,400 yards in diameter, lies under Makri Hill close to the shore. Its southern part is connected to the coast by a shallow rocky bar with only 2 feet water, which acts as a perfect breakwater during southerly winds to the little harbor of Makri northwestward of the islet. The southern end of the islet is low and a reef of rocks above water extends off about 100 yards. On the southeastern side is the smaller islet of Ophidi, with 10 fathoms water between.

Makri Harbor.—Coasting vessels find shelter in Makri Harbor, and there is some small coasting trade, for the convenience of which a stone pier has been constructed in the southwestern part of the port near the town; it affords a good berth for one large vessel and is sheltered from all winds except those between north and east.

Anchorage.—A good berth is in 12 fathoms midway between the island and the main, with the northern extremity of Makri Island bearing about 55°, 600 yards.

Santa Panaghia.—At 5½ miles northwestward of Makri Islet is the beach and village of Santa Panaghia, the skala, or landing place, for the town of Potamo in the interior; it may be recognized from seaward by the village on the shore, with a tower southward of it. Cape Spathi, the northern extremity of Kithera, is about 3½ miles farther northwestward.

Communication.—Steamers call here from the Piræus weekly.

Telegraph.—The submarine cable from Niapolis in Vatika Bay is landed here, Potamo being a telegraph station.

Anchorage.—The anchorage is in about 12 fathoms off the town.

Antikithera (Cerigotta) Island.—At 17 miles 146° from Cape Kapela (the southeastern point of Kithera) is Cape Kephali, the northern end of Antikithera (ancient Ægilia), a narrow, rocky island, 5¼ miles in length north-northwest and south-southeast, nearly 2 miles wide in the middle, and gradually narrowing to the extremities. The island is hilly and about 2 miles from the southern end is 1,230 feet high; it has a sterile aspect; the inner valleys are, however, cultivated. The coast is iron-bound, with steep, inaccessible cliffs, and no sand is to be seen. The population is about 500.

Pori Islet.—Four miles northwestward of Antikithera are the Pori and Poretti Islets and dangers. Pori Islet, the farthest from Antikithera, is the larger, being about 1,400 yards in length, northeast and southwest, 410 feet high, steep-to, and bearing 346°, 4 miles from Cape Kephali, the northern extremity of Antikithera.

Vythi Rock, with 4 fathoms on it and deep water around, lies 1,600 yards, 355° from the western end of Pori; the soundings are 40 fathoms between the two.

Digitized by Google

Poretti Islet, situated 1¾ miles 242° 30′ from Pori Islet, is about 400 yards in diameter, 130 feet high, cliffy on all sides, with a rock above water at its western end, and steep-to all around; between the two islets the depths are from 40 to 48 fathoms.

A singular horizontal mark 7 feet above the water, and precisely the same all round Cerigotto, Pori, and Poretti, much resembling a high-water mark in places subject to regular tides, is worthy of notice. The rock being worn away to the depth of 2 inches, so uniformly straight and horizontal, attracts the eye in a moment. It is said that in winter the water is at times higher than usual, but never reaches this mark.

Nautilus Rock.—This rock, on which the British naval sloop Nautilus was wrecked in 1807, lies 1¼ miles 169° from Poretti, and 3 miles 304° from Cape Kephali of Antikithera. The rock is 300 yards in extent eastward and westward, in some parts 9 or 10 feet above the sea, and from a distance has the appearance of scattered rocks, being very pointed and rugged; the depths around are from 20 to 30 fathoms in all directions at 100 yards from the rock. At the eastern end is a shallow spot about 50 yards in extent.

One-third of a mile northeastward of Nautilus Rock is a rocky uneven bank, of from 4 to 12 fathoms water, about ½ mile in diameter and a small patch of 3½ fathoms to the northwestward of the 4-fathom shoal; between these banks and Nautilus Rock the depths are from 34 to 40 fathoms.

Cape Kephali, the northern extremity of Antikithera, is formed of red cliffs, 630 feet high, and steep-to; about 800 yards 287° from the cape is the little islet or rock of Psira, 200 yards in diameter, with 19 fathoms water between it and the cape.

The western coast of Antikithera is high, rugged, clear of danger, with deep water close-to. Camarella Creek, a rocky indentation in the coast, is at times used by boats during strong easterly winds.

Cape Apolitares, the southern extremity, is a level projecting point about 80 feet high, steep-to, and 16 miles 312° 30′ from Agria Grabusa, near the northwestern extremity of Crete.

The eastern coast is clear, but not so high as the western; there is a small bay on the southeastern side, but Potamo, about 1¼ miles southeastward of Cape Kephali, is the only port in the island.

Port Potamo, 600 yards wide at the entrance and ½ mile deep, is open to the northward; it extends southward between high rocky shores, narrowing at two inner points, within which it forms a nearly oval space about 400 yards in extent 28° 30′ and 208° 30′. At the entrance the depth is 20 fathoms; in the inner part, from 10 to 6 fathoms. The village of Potamo is at the southwestern part of the port, and a white fort stands on a hill on the southeastern side.

Digitized by Google

Cape Kastro, the eastern entrance point, is formed of high, round, steep cliffs, on which are the ruins of Paleo Kastro. At 300 yards off the northeastern face of the cape are the Thermoni Rocks, 30 feet high, with shallow water extending southward from them, but leaving a narrow passage 5 fathoms deep between them and the shore rocks.

With any sea at the entrance sailing vessels entering the port should carry sufficient sail to insure steerage way; with strong northerly winds a heavy, dangerous swell sets in.

Channels.—Three channels lead from the westward to the Aegean Sea, each named from the island on its northern side. The Elaphonisos Channel, the northern, is the narrowest; Kithera Channel, the middle, is the most intricate; and Antikithera Channel, the southern, the widest and clearest of danger.

Elaphonisos (Cervi) Channel, although the narrowest, is the most direct for vessels from the westward and is chosen in preference to the others, as it has the advantage of the lights on Cape Matapan and on Cape Spathi, at the northern end of Kithera. With favorable winds, after passing Sapienza Island and rounding Cape Matapan, steer for Cape Spathi Light, leaving it about 2 miles to the southward, and continue eastward, but in a sailing vessel do not pass too close to Cape Malea for fear of getting becalmed. This channel is much frequented, and many vessels pass through it daily. The state of the weather in the archipelago may thus be learned from passing vessels. In the Elaphonisos Channel it often happens that sailing vessels from the westward approach those from the archipelago, each before the wind, when it becomes necessary to watch and consider which wind is likely to have the mastery. The channel is clear of danger except for the 3 fathom rock off Cape Spathi.

With northeasterly winds, work up under the lee of Kithera so as to avoid the current, and, if necessary, lie-to or anchor. The occasional anchorages are Pallikari, Phana Kopia, and St. Nikolo Bays in Kithera and Vatika and Saraceniko Bays on the mainland.

Kithera (Cerigo) Channel.—Should a vessel from unfavorable winds or other causes be so far to the southward as to render it advisable to take this channel, Ovo Islet should be the guide. By day, with a fair wind, pass on either side of Ovo and southward of the Kupho Islets. At night pass southward of Ovo and steer eastward with the islet bearing 276°; when the highland at the eastern end of Kithera bears westward of 355° a vessel will be eastward of the Kupho Islets and may steer as convenient. Cape Spathi Light will open out on a 321° bearing and Cape Malea Light when bearing 345°. In working through this channel, keep nearer Kithera than Pori Islet and check the vessel's position by bearings of Ovo Islet, Kapsali Bay Light, and the highland at the eastern end of Kithera.

Digitized by Google

Antikithera (Cerigotto) Channel, between the island of this name and Crete, is the widest and without impediment. The Madara Vuna or White Mountains of Crete, about 8,100 feet high and nearly always capped with snow, are seen at a great distance. In taking this channel vessels should keep Antikithera Island on board.

Morea, East Coast.—From Cape Malea, the high bold southern termination of the Elos Peninsula, the east coast of the Morea trends in a general north-northwest direction for 16½ miles to the islet and town of Monemvasia; the shore between is irregular, with only two or three isolated rocks close in, and the water deep. Cape Kamili, 6½ miles from Cape Malea, is a small low promontory with a hummock on it, said to resemble the back of a camel. The fixed white light on Cape Malea will be lost sight of when it bears eastward of 175°.

The town of Monemvasia is conspicuous from seaward, and the coast thence trends north and northeastward 6 miles to Cape Ieraka and then about 52 miles 338° to the head of the Gulf of Nauplia; it is all irregular, with deep water, and no shelter or good anchorage until near the head of the gulf. Nothing can be more rugged or inhospitable in its general appearance than the shore of the Morea from Cape Malea northward and along the western side of the Gulf of Nauplia, which is all high and mountainous. Mounts Saphlaurus, Sevetila, and Zavitsa rise respectively 2,458, 3,622, and 3,190 feet above the sea, immediately over the coast; the former mountain is about halfway between Monemvasia and Nauplia and the latter 7 miles from the head of the gulf.

Monemvasia.—The town of this name, with a population of about 500, stands on an islet 1,800 yards in length east and west, or at right angles to the general line of coast, to which it is connected by a rocky ridge, over which a bridge 536 feet in length has been constructed on 14 small arches. The castle is on the summit of the islet, and the town, on its southeastern face, occupying one-third the length toward the east end, is inclosed between two walls descending from the castle to the sea; the houses rise one above the other and are intersected by narrow intricate streets. Many of the buildings, of Venetian construction, are now in a ruinous state; there is little or no trade.

At 2 miles inshore on the mainland Mount Lakanas rises 1,960 feet above the sea.

Light.—A square masonry tower, 23 feet high, is erected on Cape Monemvasia, from which a fixed red light is exhibited, at an elevation of 54 feet above the sea, visible 8 miles. (See Light List.)

Temporary anchorage during summer will be found to the northward of the bridge, in from 15 to 18 fathoms water, sand, and weeds. In the event of a southerly or southwesterly gale with a

Digitized by Google

falling barometer off Cape Malea, the sea here will be comparatively smooth, though the squalls blow over the low neck of land with great violence, and a vessel taking shelter should be prepared for a sudden change of wind to the northward of west, with a continuance of heavy squalls.

Communication.—There is weekly connection with Nauplia by a small steamer. Monemvasia is also a telegraph station.

Port Paleo.—At 2½ miles northward of Monemvasia is Port Paleo, a little bay with anchorage for small vessels in 4 fathoms water, sheltered from all northerly and westerly winds. There is no town here, but about ½ mile westward from the head of the port and near the shore are the ruins of Paleo Monemvasia, the ancient *Epidaurus Limera*.

Kremidi Bay, about 1½ miles westward of the cape of the same name, is nearly ½ mile deep, 1,200 yards wide at the entrance, with from 6 to 19 fathoms water, and sheltered from all northerly and westerly winds, but open to the southward and southeastward.

Cape Kremidi bears 31°, 2.7 miles from Cape Monemvasia; a bank with depths under 10 fathoms extends about 1,400 yards southwestward from the cape, and at a distance of 350 yards therefrom the depth is 5 fathoms.

Cape Ieraka is a prominent headland bearing 23°, 3 miles from Cape Kremidi, the coast between falling back 1 mile and containing the little islet of Daskalio.

Port Ieraka (ancient *Zarax*), 1¼ miles northwestward of the cape of that name, is difficult to make out on account of its narrow entrance, which between Cape Kari and Point Kyphanta, its southeastern and northwestern entrance points respectively, is only 600 yards wide, with high land around it. It is open to the northeastward, and on the western side of the entrance are the extensive ruins of the Acropolis of Zarax. At 700 yards within the entrance the width is reduced to 200 yards; the port then trends west-northwestward for ¼ mile, diminishing in breadth with a depth of 7 to 2 fathoms water, mud bottom, and fit only for small craft. The port thence leads into a large shallow lagoon, with a staked fishery; there is no village.

Landmark.—A church, which forms a useful mark when making Port Ieraka, is situated on the summit about 1,800 yards northwestward of Cape Vathi.

Leonidi, or Plaka, with a population of about 3,700, stands about 1½ miles back from the shore, midway between Cape Ieraka and the head of Nauplia Gulf.

Light.—A fixed red light is exhibited at an elevation of 36 feet above the sea from an iron pole 20 feet high at Leondi; it should be visible 5 miles.

Digitized by Google

Communication.—There is a customhouse at the port, and steamers from Piræus and Nauplia occasionally call.

Leonidi is a telegraph station.

Karavi, a small barren islet or rock 28 miles 44° from Cape Malea, derives its name from its likeness at a distance to a ship under sail. It is 110 feet high, steep-to on all sides and almost inaccessible; in fine weather it is frequented by fishermen, who state that the finest fish are to be caught here.

Belo Pulo (Parapola), lying in the track of vessels bound to Athens, is 10 miles, 32° from Karavi Islet, and its southern end is 31 miles, 26° from Cape Malea The islet is 2 miles in length 332° and 152°, about 700 feet high, with a sunken rock on either side of its northern end; on rounding Cape Malea it appears like an egg cut in two, though on a nearer approach this appearance alters. It is difficult of access, and is uninhabited except by the lighthouse keepers; it offers no attractions to passing vessels.

Light.—From a square tower, 33 feet high, on the northwest point of Belo Pulo is exhibited, at an elevation of 367 feet, a flashing white light, visible 26 miles, but is obscured over Karavi. (See Light List.)

Phalconera, the third islet of the group, is 600 feet high and lies 14 miles, 73°, 30′ from Karavi; it is only occasionally sighted by vessels on the route to Athens, but on the direct course to the Doro Channel it is more often seen. A sunken rock lies at its western end. It is uninhabited, but visited by fishermen.

Caution.—The current at times runs strongly in the vicinity of these islets, and raises a cross sea; sailing vessels should therefore pass them at a prudent distance.

Intended light.—On unwatched flashing white light, showing 1 group of 3 flashes every 12 seconds, having a luminous range of 15 miles, will be established on Phalconera Islet. (1913.)

The Gulf of Nauplia (Argolikos) from between the island of Spezzia Pulo, on the east, and Cape Sabbatiki, on the west, trends north-northwest 27 miles to the low shore of the plains of Argos, at its head. It is bounded on either side by high mountainous land, the coast line on the west being a little irregular and interspersed with low shore, while that on the east has several bays, projecting points, and islands. In the central part the water is 450 fathoms deep, but all over the head of the gulf within a distance of about 4 miles of the shore there are from 20 to 6 fathoms, and vessels if necessary may anchor in any part of it, on mud or sand bottom.

Astros is a fortification standing on a rocky promontory projecting from the plains of the same name on the western shore of the Gulf of Nauplia and 9 miles southward of the town of Nauplia. It has no port, but a vessel might drop an anchor for temporary purposes

Digitized by Google

with offshore winds. The village is small, and here the second Greek Congress was held, in the month of April, 1823.

Light.—A fixed red light, elevated 77 feet above the sea, is shown from a square masonry tower, 23 feet high, situated on the cape to the southeastward of the Acropolis of Astros. (See Light List.)

Telegraph.—Astros is a telegraph station.

Caution.—The soundings between Cape Astros and Cape Purno, on the western side of the gulf, are reported to be shoaler than shown on the chart.

Argos.—At about 3 miles inland from the head of the gulf and 5 miles northwestward of Nauplia, on the western side of the large and fertile plain of Argos, is the town of the same name with a population of about 10,000. Here are the scattered remains of ancient Argos, and on a hill 936 feet above the sea and westward of the town is the Acropolis of Larissa, formerly a place of some strength.

Argos is on the line of railroad from Corinth to Tripolitza, and a branch goes to Nauplia.

Myli.—On the shore on the west side of the gulf opposite Nauplia and under Mount Pontinus, 582 feet high, is the village of Myli. The shallow ground which from Nauplia extends all round from the head of the gulf prevents a near approach in a vessel of large draft, and in anchoring, the lead should be the guide. The south wind is here felt to its full extent, but the holding ground is good. Myli is on the line of railroad from Argos to Tripolitza.

Nauplia, commonly called *Napoli di Romania,* is on the eastern side and near the head of the gulf and on the site of the former town, one of the most ancient in Greece. It stands upon the northern side of a table-land 282 feet high, which projects from a steep lofty ridge named Palamidi. The streets are narrow but straight, and the principal one divides the town into two parts, connecting the two squares, and terminating at the land gate. The larger square is mostly occupied by barracks and coffeehouses. Some of the houses are large and comfortable, but the majority are small and crowded, though apparently clean and neat, with some good shops.

The town has two fortresses, one of which stands on the summit of the precipitous ridge of Palamidi, southeastward of the town, 719 feet high, and inaccessible on all sides except at one point on the eastward where it is connected with a range of barren hills. The second fortress, that of the Acro-Nauplia, stands on the table-land southward of the town, at the foot of the Palamidi. Nauplia was the seat of government after it fell into the hands of the Greeks till 1832, when it was removed to Athens.

The landing quay is on the northern side of the town, where the shore forms a well-sheltered bight, with a general depth of from 13 to 23 feet, nearly up to the quay. There is also a mole built on the

Digitized by Google

rocks off the customhouse, which has recently been lengthened, and a channel to the quay has been dredged. The little isolated rocky islet of Burgi, on which is a fort and prison, is about ¼ mile northwestward of the town.

The fortress of Palamidi can be distinguished from a vessel soon after passing Spezzia, and the Acropolis of Larissa and the town of Argos when a few miles farther up the gulf.

Lights.—Upon Panagia Point (the name given to the southwestern extremity of the peninsula), is erected a pole attached to a hut, from which is exhibited, at a height of 37 feet above the sea, a fixed red light visible seaward 4 to 5 miles.

A fixed light is exhibited from the end of the customhouse mole, which shows green to seaward and red over the port. (See Light List.)

The anchorage at Nauplia is in from 7 to 9 fathoms, mud bottom, at any convenient distance westward and southwestward of the town. Vessels of light draft may anchor off the mole, as in southerly winds Panagia Point breaks the sea to a great extent. Eastward of the mole, the water is shallow and the air is not so pure. In addition to the bank with depths under 5 fathoms, which follows around the head of the gulf at the distance of 1 mile, there is a patch of hard ground with 4 to 5 fathoms water on it, the southeastern extremity bearing 273°, 1,700 yards from Fort Burgi. Some of the bowlders on these patches are 6 or 7 feet in height. Large vessels should therefore not anchor with Fort Burgi bearing eastward of 79°. Although a nasty short sea gets up with southerly winds, making it uncomfortable for vessels' boats, large vessels lie here all seasons.

Bank.—A bank with a least depth of 6 fathoms, hard bottom, lies 1,400 to 1,600 yards 236° 30′ from Fort Burgi. Large bowlders were reported to have been seen in this position, with a depth of 5 fathoms over them, but the examination in 1899 by the British naval vessel *Stork* failed to discover them.

Population.—The town has a population of about 6,000.

Supplies.—Fresh provisions are plentiful and cheap.

Communication.—Steamers run daily to the Piræus, in addition to which regular connection is kept up with Kithera Island, Patras, and certain intermediate ports.

By a branch line from the town of Argos, Nauplia has railroad communication with Corinth, Athens, Patras, and Tripolitza.

Nauplia is a telegraph station.

Trade, shipping.—The chief exports from Nauplia consist of tobacco, cheese, oil, olives, and sultana raisins. The imports are grain, rice, coffee, sugar timber, copper, iron, cloth and cotton textiles, dried fish, and glassware.

Coal.—No stock of coal is kept here, but it can be obtained from the Piræus by giving a week's notice. The best plan is to telegraph

Digitized by Google

or write to the consul there, who will make all the arrangements as to conveyance, price, etc.

Water.—Myli is an excellent watering place, the stream running all the year round, the only inconvenience being the shallowness of the shore.

Winds.—During summer the sea and land breezes are very regular; the sea breeze sets in from the south-southeast about 11 a. m., and blows until between 8 and 10 p. m. It is then succeeded by the land wind from north-northeast, which continues until about 6 a. m., when it falls calm until the sea breeze again sets in. Vessels leaving the anchorage under sail should way get under way with the first of the land wind, so as to be sufficiently far out of the gulf when the sea breeze springs up in the forenoon.

Karathona Bay.—From Nauplia the shore trends south-southeastward nearly 2½ miles to Cape Khondros. Karathona Bay, on the northern side of the cape, affords good anchorage, in 11 fathoms, ¼ mile to the northward of Karathona Island, which is 45 feet high and connected to the cape by a shallow bank.

St. Vincent Shoal.—St. Vincent Shoal, with 5¾ fathoms water on it, lies nearly 800 yards 242° from the southwestern extremity of Cape Khondros, and should be avoided by vessels of heavy draft. The southwestern edge of Dhascalia Islet bearing eastward of 118° 30′, and open of the nearer part of Tolon Island will lead southwestward of the shoal; there are 8 and 9 fathoms water close to it.

Port Tolon.—At 1¾ miles southeastward of Cape Khondros is the island of Tolon, 1 mile in length, bold and steep-to. Its northwest coast forms, with Cape Rui opposite, a narrow passage with 7 fathoms of water into Port Tolon; fronting the inner end or eastern pass to the port is the little islet Koro-nisi, with deep water around it. Tolon Island shelters vessels from southwest winds, but Port Tolon is useless except for small vessels that can make fast to the shore, the bottom being loose gravel. In the bay eastward of Port Tolon, except near the shore, the water is everywhere too deep for ordinary anchorage. There is a colony of Cretans in the village of Rui at Port Tolon.

Dhascalia.—On the southwestern side of Tolon Island, at the entrance of a rocky bay, is the little islet of Dhascalia, with a building on it.

Tolon Rock, with 2 fathoms water on it, and 14 to 36 fathoms around, lies about 1 mile 124° from Dhascalia Islet.

Clearing marks.—Cape Khondros, open westward of Tolon Island, bearing 307°, leads southwestward of the rock; Mount Chakali, 319°, open eastward of Tolon Island, leads northeastward of the rock; Mount Ortholithi, open southward of the triangular cliff on Platia Island, bearing 81°, leads southward of Tolon Rock.

Digitized by Google

Port Khaidari (or Vivares), 3 miles eastward of Port Tolon, is an inlet trending northwesterly nearly 1 mile by about 700 yards in breadth. It carries from 30 fathoms water at the entrance to 5 fathoms at 400 yards from its head, where it leads into a shallow lagoon. The port is well sheltered, but surrounded by highland which causes baffling winds, and makes it difficult to enter or leave under sail; the largest vessel, however, may pass the shore within 50 yards. The entrance is narrow and difficult to make out, but it may be known by the ruins of a fort on the western point of entrance and a little chapel on the eastern point. There are no houses here.

Platia Island, 1.3 miles in length northwest and southeast, is bold all around. It lies about 1.3 miles southward of Port Khaidari, and on its western side is a conspicuous white triangular cliff, one of the marks for avoiding Tolon Rock lying 1.5 miles westward of the island and just alluded to.

Hypsili Island, 1.5 miles in length east and west and 786 feet high, is bold and cliffy on the southern side, and steep-to all around, the 100-fathom curve of soundings passing within about 300 yards of its southern side. It lies nearly 1.3 miles from Cape Ieri, with depths of from 32 to 80 fathoms between.

Cape Ieri is a projecting point 5 miles southeastward of Port Khaidari, the low shore between forming a slight bay, with deep water, and clear of danger excepting the shallow water bordering the shore at 400 yards on the western side of the cape and for 2 miles to the northward.

Vourlia Bay is a deep indentation in the coast between Capes Ieri and Vourlia. The depths are from 19 to 60 fathoms, and it is open to the southwest.

Port Kiladia.—Cape Thynni bears 144°, 4¾ miles from Cape Ieri, and these two capes form the horns of a bight 4¼ miles deep, with an irregular shore indented by two or three bays. In the eastern part of the bight is Port Kiladia, about ¾ mile deep and about 700 yards wide. It is fronted by an islet having a narrow passage on either side of it into the port, which is landlocked and in the outer part from 3 to 5 fathoms deep, mud bottom, but with less than 3 fathoms abreast the customhouse, whence it shoals rapidly to the head of the port.

On the southwestern side of the port are a monastery, customhouse, a few houses, and jetties, being the port of Kranidi, a town containing a population of about 7,000, situated on a hill 627 feet high, 2½ miles southeastward.

Shoal.—A shoal patch with 3 fathoms water on it, which should be avoided when in this vicinity, lies 700 yards eastward 191° 30′ from Cape Thynni and nearly the same distance from the coast.

Coast.—From Cape Thynni the coast trends southerly 2½ miles to Cape Koraka, when it turns eastward round Vevaronda Bay to Port

Digitized by Google

Kheli on the southeast. The shore between is irregular, with various small cliffy projections.

At about ½ mile northward of Cape Koraka is the little islet of the same name, bordered by rocks to a distance of 300 yards; there is a narrow boat passage between the islet and the shore. The eastern shore of Vevaronda Bay is low and bordered by shallow water, which extends more than ½ mile from the shore. The bay is frequented for salt, which is made in the lake supplied from salt springs between it and the head of Port Kheli.

Port Kheli (Porto-Khelion).—The entrance to this port, 3 miles northeastward from the western end of the island of Spezzia, is narrow, but widens within into a spacious basin; the anchorage, however, available for large vessels is limited to the inner part of the channel, where the depth is about 5 fathoms, mud, the depth all around the harbor being sufficient only for small vessels.

The channel into the port is about 1 mile in length, and the distance between the lighthouse point and Kaluiri Rock, which may be considered the entrance points of the port, is 800 yards; this breadth diminishes to less than 400 yards about halfway in. On the southeastern side of the port are the ruins of the ancient town of Mazes, the greater part of which are covered by the water; some of the buildings could have been but 8 or 10 feet square.

Kaluiri Rock, beacon—The three inner points on the southeastern side of the entrance channel when in line form a good clearing mark for the Kaluiri Rock, which is marked by a beacon 13 feet high and is situated off the southeastern entrance point.

The modern village of Leonidion and customhouse are on the western shore of the port. Fresh provisions may be procured at Kranidi, 3 miles inland.

A telegraph cable from a small cove between Alexandro and Laspo Bays connects this port with the most northern point of Spezzia Island.

Communication.—Steamers calling at Spezzia from Piræus and Nauplia occasionally stop at Port Kheli. The town of Kranidi, just alluded to, is a telegraph station.

Light.—On the northwestern point of entrance to Port Kheli a fixed red light is shown, at an elevation of 69 feet above the sea, from an iron pole 20 feet high; it is visible 5 miles. (See Light List.)

Coast—Chenesar Islet, on the southeastern side of the entrance to Port Kheli, is bordered by shallow water, and 100 yards from its southwestern side is a rock with ½ fathom water over it. From the islet the coast trends southeast and eastward 3¼ miles to Cape Milianos; it is irregular with several little coves and rocky patches off some of the projecting points.

Digitized by Google

Shoal.—A detached rocky shoal with 3½ fathoms of water on it and 9 fathoms between it and the shore lies 1,200 yards, 156° 45′ from the southwestern end of Chenesar Islet and 600 yards from the nearest shore. No marks can be given for this danger, though the discoloration of the water over it may at times be seen.

Shallow ground.—From the point next westward of Cape Milianos shallow ground extends 600 yards to the southward; at half this distance there is only 1 fathom of water.

Clearing mark.—The northern point of Trikeri Island, in range with the southern extremity of Karteli Islet, bearing about 92°, leads well southward of this bank. In working through Spezzia Strait avoid too near an approach to either shore.

Temporary anchorage will be found in the mouth of the bay about 1¼ miles southeastward of Chenesar Islet; the bottom is sand and tolerably good holding ground.

Cape Milianos, the southeastern extremity of this part of the mainland is a steep white point with a church on it. Rocks uncovered and covered extend 400 yards southward of the cape, and to avoid them do not open Ventza Islet off Trikeri until Mount St. Elias is in range with Tigani Island, bearing 344°, on account of the current, which depends on the force and direction from which the wind may have been blowing.

Milianos Shoal.—This small rocky patch of 23 feet, and deep water around, lies 1¼ miles 165° from Cape Milianos.

Clearing marks.—Alexandro Islet, well open northward of Trikeri Island, bearing 87°, leads northward of the shoal; Mount St. Elias, well open either eastward or westward of the church on Cape Milianos, leads eastward or westward of the shoal; and Point Mezzo kept between Joannis and Mikro Islets, bearing 212°, leads eastward of Milianos Shoal and westward of Trikeri Shoal.

Trikeri Shoal.—This is another rocky shoal 1¼ miles 113° from Milianos Shoal, with 3 fathoms on it, and deep water around.

Clearing marks.—Mount Eros, the highest peak of Hydra, halfway between Trikeri and Petasi Islands, bearing 73°, leads northward of Trikeri Shoal and southward of Milianos Shoal; Mount Eros shut in southward of the northern end of Trikeri Island 69° leads southward of Trikeri Shoal. Drapi Islet open of the southern end of Trikeri Island, bearing 85° also leads southward of the shoal.

These dangers should be passed with caution, as at times the current sets over them with considerable strength; and in working through Spezzia Strait in a large vessel avoid too near an approach to the mainland when in the vicinity of the 3½-fathom shoal southeastward of Chenesar Islet, and observe the same rule on the island side from the lighthouse until westward of the town.

Digitized by Google

Spezzia (Spetsai) Island is 4 miles in length northwest and southeast, 2 miles in breadth, being somewhat in the shape of a pear. A ridge runs through the island, which attains its greatest elevation in Mount Elias near the center, 815 feet high, with a church on it. Its coast line is irregular, and on the northern side the shore of the town as far westward as the point, 1½ miles westward of the lighthouse windmills, is bordered by a bank extending off 300 yards.

The western part of the coast is steep-to, but the salient points should be avoided.

Though rocky and generally barren, Spezzia has pasturage for goats and many patches of soil which are carefully cultivated; it produces a little wine. It has one tolerable spring, which is near the middle of the island; the well water is said to be brackish. The climate is exceedingly healthful. The island has a population of about 4,500.

Light.—From a cylindrical tower about 34 feet high, situated near the northeastern point of Spezzia Island, is exhibited, at an elevation of 98 feet above the sea, an occulting white light, visible 15 miles.

Spezzia.—The town is situated on the northeastern side of the island and has a population of about 4,400, or nearly all the inhabitants of the island.

A small inlet at the eastern end of the town, about 600 yards deep, with depths of 2 to 3 fathoms, affords accommodation for coasting vessels, which secure head and stern. On the western side going in are some rocks with 1 fathom water on them. Large vessels anchor about ¾ mile northwestward of the lighthouse and about ¼ mile from the shore, in 12 to 15 fathoms, mud, sand, and small coral, fair holding ground; or, if necessary, farther out.

Communication is maintained with Piræus by steamer twice a week. Spezzia town is also a telegraph station.

Bromboli, a high conical rock or islet, lying 1,400 yards northwestward of the western end of Spezzia, has from 3 to 7 fathoms around and deep water outside it. At about 300 yards 152° from Bromboli is a rock just above the surface of the water. Between this rock and Spezzia is a channel with depths of 12 fathoms, but which is narrowed to about ¼ mile in breadth by a shoal with ¾ fathom water on it, lying 300 yards from the shore of Spezzia; between the shoal and Spezzia Island the depth is from 3 to 7 fathoms.

Spezzia Pulo (Spetsopoulon), on the southeastern side of Spezzia, is about 1.3 miles in length, and is separated from Spezzia by a narrow passage known as Pulo Strait, carrying depths of 6 to 7 fathoms water.

Rock.—A rock with about 1 fathom water on it lies on the northern side of Pulo Strait and about 250 yards from the southeast coast of Spezzia Island, narrowing the navigable breadth of the strait to 400 yards.

Digitized by Google

Mikro and Joannis Islets form a group of three or four islets surrounded by rocks above and below water, lying about 700 yards northeastward of Point Mezzo, the southeastern end of Spezzia Pulo, with depths of from 4 to 8 fathoms between. In rounding Point Mezzo the islets should be given a prudent berth.

Digitized by Google

CHAPTER III.

EAST COAST OF GREECE FROM SPEZZIA ISLAND TO EURIPO STRAIT INCLUDING DORO CHANNEL, WITH THE ADJACENT ISLANDS, INCLUDING ZEA.

Trikeri Group (*Stratonisi*).—At 5 miles eastward of Spezzia and 4 miles westward of Hydra is the island of Trikeri, 1 mile in length north and south, having two hills, the southern one being 490 feet high; the island between the hills is nearly divided into two parts connected by a neck about 200 yards across.

Between Trikeri and the western end of Hydra are the following islets: Drapi, Strongilo (conical), Karteli, Disaki, Ventza, and Alexandro; this latter islet, next in size to Trikeri, lies southward of Cape Bisti, the western end of Hydra, from which it is separated by a clear and deep channel ½ mile wide.

Shallow patches.—The soundings between and around these islets are generally deep, but between Strongilo and Karteli, and nearly on the line joining the northwestern sides of these islets, there are two shallow patches, one nearly ½ mile from Strongilo, with only 4 fathoms of water on it; the other patch, about the same distance from Karteli, has 7 fathoms on it. There is also another patch, with 5 fathoms on it, nearly 400 yards northeastward of Karteli, with a 2-fathom patch between it and the island. Disaki and Ventza are nearly joined by a shoal, with 2 fathoms of water over it, extending from the former islet, but there is a narrow passage, with 6 fathoms water, close to the southwestern end of Ventza.

Disaki Island consists of two separate parts, cut through at the narrowest place.

Stavro (Stavronisos) Island, nearly 4½ miles 124° from the western extremity of Hydra, is high, steep, and about ½ mile in diameter, with two rocks above water on its southwestern side. Stavro can be seen even at night for a considerable distance.

Stavro Rock.—This danger, with only 2 feet of water over it and with depths of 30 fathoms around, lies 1,400 yards 200° from the southwestern end of Stavro. Mount Eros of Hydra well open to the westward of Stavro bearing 14° leads westward of the rock.

Approaching the rock from the southward, be careful to keep all the island of Spezzia open of the southern end of Trikeri, bearing 281° until Mount Eros is well open westward of Stavro Island; the northern peak of Trikeri in range with the conical islet of Strongilo, bearing

Digitized by Google

292°, leads ¾ mile southward of the rock, and Mount Eros open eastward of Stavro bearing 4° leads eastward of the rock.

Dhoko (Dokos) Island, separated from Hydra Island by Petasi Strait, is 3¾ miles in length east and west and about 1½ miles in breadth; it is very high and steep on the southern side and at the western end 1,004 feet above the sea. Its coast line is irregular, and near the eastern end on the northern side is a bay nearly 1 mile deep, having from 7 to 18 fathoms water; a cove on the western side of the bay is used by the Hydriotes to lay up their worn-out vessels, and another cove on the eastern side is at times used for the same purpose. Dhoko has a few straggling cornfields, and has a population of about 50.

Shoal.—At 200 yards northward of the eastern entrance point of the bay is a rocky shoal about 100 yards in extent, with 2 fathoms water on it, 4 to 7 fathoms around, and deep water near it to the northward. Kivotos Islet off Port Molos (in Hydra) open of the northeastern extremity of Dhoko, bearing 231°, leads outside the shoal. A 5-fathom patch lies about the same distance eastward of the western entrance point.

Petasi Strait, between Dhoko and Hydra Islands, is more than 1 mile wide, clear of danger, with deep water throughout. As Dhoko is high and bluff, it is necessary when working through this passage to watch the variable squalls, or eddy winds. At times the current here runs to the eastward even with fresh northeasterly winds.

Dhoko (Dokos) Strait.—The western end of Dhoko Island is separated from the shore of Cape Muzaki, of the main, by a clear and deep channel 800 yards wide; but it is inconvenient for sailing vessels, as the wind here is almost always baffling, and calms are frequent, caused by the high land of Dhoko.

Cape Muzaki, bearing 48°, 5 miles from Cape Milianos, is the northeastern entrance point to the deep bay formed between them.

Hydra Island (ancient *Hydrea*) is 11 miles in length in a northeasterly and southwesterly direction, with an extreme breadth from Cape Rigas to the town of Hydra of about 2½ miles. It is almost entirely composed of bare sterile rocky land; the layer of soil is very thin. Mount Eros, near the center, is 1,958 feet above the sea. The coast line is rugged and irregular, with deep water nearly everywhere around it, more especially at the eastern end, where the depth of 100 fathoms is found at 400 yards from the land.

The principal town of the island bears the same name and stands on a barren rugged height surrounding the port near the middle of the northern shore; the houses are substantially built, many of them with large and airy apartments, with marble pavements, the public edifices including many churches and religious establishments, an exchange, a college, commercial, navigation, and elementary schools.

Digitized by Google

The streets are uneven and precipitous, but remarkably clean. The manufactures are silk and cotton stuffs, soap, leather, etc. The population of the town is about 7,100, a large proportion of whom, unable to derive subsistence from the soil, devote themselves to trade, commerce, and navigation.

Communication.—There is connection with Piræus and other ports twice a week by steamer. The town of Hydra is also a telegraph station.

Light.—On Tabia Point, the eastern entrance point of Port Hydra, is exhibited from an iron shed a fixed red light, elevated 40 feet above the sea, and visible 6 miles. (See Light List.)

The port of Hydra is about 400 yards deep, with 11 fathoms water in the middle; all vessels moor with the stern to the shore. There is no anchorage off the port.

Ports Molos and Mandraki.—The little port of Molos, on the west, and that of Mandraki, on the east, are much used by the Hydriotes to lay up worn-out vessels.

In Port Mandraki a buoy is moored to assist vessels in warping in or out in contrary winds, though the port is reported to be nearly useless as an anchorage on account of the number of wrecks.

Islets.—To the westward of the town of Hydra are two small islets, Kamini and Vlikos; they lie about 400 yards from the shore, and Vlikos, the western one, is connected to the shore by a shoal with 4 fathoms water on it. Farther westward is Palamida, another little islet or rock; off Port Molos are the Kivotos and Erimo-nisi; farther westward, off Cape Bisti, the northwestern end of Hydra, are Petasi and Pontiko-nisi. These islets lie from 400 to 1,200 yards from the shore; within them the water is deep and the channels fit for coasters.

Light.—At 93 yards within the extremity of Cape Zurva, the eastern point of Hydra Island, is a square tower 36 feet high, built above the keeper's dwelling, which exhibits at an elevation of 118 feet above the sea a fixed white light, varied by a flash visible 17 miles, partly obscured. (See Light List.)

The south coast of Hydra appears to be broken and rocky, and the water is everywhere too deep for anchorage. Between Capes Zurva and Rigas the 100-fathom curve is only from 400 to 1,600 yards from the shore; in this space there is one bay, but it appears to be useless. Westward of Cape Rigas the water is not so deep, but even here the 30-fathom curve is nowhere more than ½ mile from the shore. On the whole of this coast there are no off-lying dangers excepting a small island called Nisizza, which lies 600 yards offshore at 2 miles to the westward of Cape Rigas.

Kappari Islet and shoals.—On the northern side of Cape Muzaki on the mainland the shore forms a bay nearly 1 mile deep with from 6 to 20 fathoms of water, open to the eastward, and called Port

Digitized by Google

Kuverta. Kappari Islet, surrounded by shallow water, lies off the northern point of the bay, with a narrow channel 6 fathoms deep between. A patch of rocks above water extends northeastward nearly 400 yards from the islet, with 18 fathoms close to them. At about 400 yards 48° from the outer rock is a shoal with 3 fathoms water on it. Outside this 3-fathom shoal and 1,300 yards 62° from the outer rock is another rocky patch with 5 fathoms water and 18 to 20 fathoms around; it lies nearly 1½ miles 6° from Cape Muzaki.

The northeastern point of Trikeri Island in range with the western extremity of Dhoko Island, bearing 175°, leads 200 yards westward of the 5-fathom patch and between it and the 3-fathom shoal. To lead eastward of the shoals keep the western end of Dhoko Island bearing westward of 186°, on which bearing the whole of Trikeri will be shut in.

Port Kappari, to the northward of Port Kuverta, is a bay about 1½ miles deep, partly formed by two tongues of land, with a low shore at its head; on the shore near the northern angle of the bay is a convent. The bay is open to the eastward, but on the southern side there is anchorage in from 9 to 13 fathoms, mud bottom and good holding ground.

On the northern side of the bay is the town or village of Kastri; thence a low tongue of land, with the ruins of *Hermione* on it, projects eastward, forming the southern side of Port Kastri, fit only for small vessels. Northeastward of Port Kastri is another bay with good holding ground.

Light.—A fixed red light elevated 68 feet above the sea is shown from a metal column on Cape Kastri; it should be visible 6 miles. (See Light List.)

Mount Didyma.—Cape Thermisi, a projecting point, is 2.3 miles eastward of Port Kastri; this cape and Cape Muzaki, containing the four bays just alluded to, are the ends of spurs from the elevated mountain of Didyma, which at about 6 miles from the coast is 3,541 feet above the sea. The highland, though of less elevation, continues eastward to Cape Skyli, 11 miles from Cape Thermisi, and its base all along is a low shore clear of danger.

Hydra Bay, between the low shore of the mainland on the north and Dhoko and Hydra Islands on the south, is everywhere clear of danger except the shoals in the western part already named and a shoal off Supia Island.

Shoal.—At a distance of 900 yards 243° from the southwestern point of Supia Islet is a rocky shoal about 30 yards in extent, with 2½ fathoms of water on it and deep water around, with depths of 10 to 12 fathoms for a distance of 400 yards between it and the shore.

Anchorage.—The anchorage in this bay is off the northern shore between Cape Thermisi and a low projecting shingle point nearly

Digitized by Google

4¾ miles 85° from it. A little eastward of the point is a large white building, formerly a convent, and also an olive grove, and 1.2 miles westward of the point is a small chapel. The best berth is in 19 fathoms of water about ½ mile from the shore, with the chapel bearing about 0° and the point 85°. This anchorage was known in the British squadron, during the Greek revolution, as Garden Bay.

From Cape Thermisi the shore nearly as far eastward as Supia Island, 1½ miles westward of Cape Skyli, is bordered by a narrow bank from 200 to 400 yards wide, falling suddenly to deep water; at night it should not be approached into a less depth than 30 fathoms, nor eastward of Supia closer than 40 fathoms. During winter the northeasterly winds blow over the highland in violent squalls.

Cape Skyli (**Skyllaion**) is nearly 6 miles eastward of the low shingle point of Hydra Bay anchorage and 5 miles north-northwestward of Cape Zurva, the eastern extremity of Hydra Island. Cape Skyli is the termination of the high mountainous range which extends eastward from Mount Didyma and the southwestern entrance point of the Gulf of Athens.

Kelevini Islands.—These two small islands, at the foot of Cape Skyli, together are about 1.3 miles in length. The western of the two is connected to the southern part of the cape by a reef with ½ fathom water on it, but the two islands are separated from each other by a narrow passage, with 8 fathoms water, called Kelevini Pass. From the southeastern side of the outer island a reef extends nearly 400 yards to the southward with deep water close-to. These islands, with Cape Skyli, form the northern entrance point to Hydra Bay, and Cape Zurva (the eastern extremity of Hydra) the southern point of entrance.

Winds and currents.—In a sailing vessel, during strong northeasterly winds, the passage through Hydra Bay is tedious, as the highland causes heavy squalls in all directions, rendering it necessary to keep under easy sail. Sailing vessels are therefore recommended to pass southward of Hydra.

It often happens that the sea breeze, which draws through the bay from the eastward, fails just as it reaches Dhoko Island, so that a vessel coming from the eastward will most likely be becalmed for some hours and have to work through the night against the land wind. The water, however, in Petasi Strait is deep on either shore. The current in this strait, at times, sets eastward with a fresh northeasterly breeze.

The currents between the islands and the main, as well as outside the islands, depend principally upon the force and direction of the winds. It often happens, however, that the land and sea breezes in the summer cause great variations in the currents; the land winds out of the Gulfs of Nauplia and Athens necessarily cause eddy currents

Digitized by Google

in the vicinity of Spezzia and Hydra, both in the channel within and outside the islands. To this may be ascribed, about halfway between the eastern end of Hydra and Stavro Islet, a ripple occasioned by the meeting of the two currents, which generally appears at the intervals between the land and sea breezes, and which before now, here and elsewhere, has been taken for shoal water.

Gulf of Athens (Saronikos).—The entrance to the Gulf of Athens, called also the Gulf of Aegina, is between Cape Skyli and Cape Colonna, 27 miles east-northeastward. The distance from Cape Skyli, or from a line between it and St. Georgio Island to the Piræus, is about 30 miles.

St. Georgio (ancient *Belbina*) or St. George d'Arbora is a small island lying 17 miles eastward of the Kelevini Islands and 9¾ miles southward of Gaidaro Islet, westward of Cape Colonna. St. Georgio is about 3 miles in length in a northwest and southeasterly direction, narrow, and 1,080 feet high. The island is rocky and but little cultivated, with a few inhabitants, who possess small flocks of sheep and goats.

Light.—A flashing white light is shown, at an elevation of 485 feet above the sea, from a tower 21 feet high surmounting a dwelling 600 yards to the northwestward of the southeastern point of St. Georgio; it should be visible 30 miles, but is partly obscured by the land. It has been reported to be irregular. (See Light List.)

Poros Island (ancient *Kalauria*), on the western side of the Gulf of Athens, is rather more than 4 miles northward of the Kelevini Islands. It is irregular in form, extending 4½ miles east and west, with a spur or peninsula projecting from its northern side and another from its southern side, the extremes of which are rather more than 4 miles from each other. The island is remarkable for its rocks of granite; the highest part, toward the eastern end, is 1,134 feet high, and a little westward are the ruins of a temple of Juno.

The peninsula (ancient *Sphæria*), on the southern side of the island, is connected to it by a low sandy isthmus and only separated from the main coast by a passage a little more than 200 yards wide, in which mud, wrecks, and some rocks considerably contract the navigable channel. The town of Poros is on the southwestern and western sides of the peninsula, and on the latter side is the Government dockyard, with a patent slip, etc. This dockyard and slip are intended for building and repairing small wooden vessels, but both are closed at the present time. The town is indifferent, but has a singular appearance, with its white houses perched among its dark volcanic rocks. The population of the town is about 4,600.

Digitized by Google

Communication.—Steamers between Piræus and Nauplia call almost daily. The town is also a telegraph station.

Poros Bay, on the southern side of Poros Island, is formed between the northeastern face of the Sphæria Peninsula and the south coast of the island, and was formerly known in the British squadron as Monastery Bay, from the monastery standing 200 yards back from the northern shore. This bay, above ½ mile square and open to the southeastward affords good summer anchorage in 15 to 19 fathoms, sand, with the monastery just in range with the point nearly ½ mile westward of it bearing 68°; the peak of St. Georgio Island in range or about 1° 30′ open of the northeastern point of the bay, and Burgi Islet, bearing about 158°. The soundings thence decrease gradually to near the beach at the head of the bay.

The water is deep in approaching, and excepting the Mavrocordato shoal of 6 fathoms, which should be avoided in vessels of heavy draft, it is everywhere clear. Burgi Islet, on the southern side of the bay, has a fort on it; and 300 yards westward of it is Lazaretto Islet and another little islet on a rocky bank extending 400 yards from a sandy point, under the lee of which there is anchorage for small vessels, with good holding ground.

Mavrocordato Shoal.—This rocky shoal, about 100 yards in extent, with from 6 to 8 fathoms on it and deep water all round, lies in the center of the approach to Poros Bay, 150 yards 77° from Burgi Islet. The eastern point of inner Kelevini Island well open of Cape Spadi, the northern point of Cape Skyli Peninsula, bearing 150° leads eastward of the shoal. From the eastward, keep the summit with three peaks (which appear over the isthmus) open northward of the house standing some way up the slope of Sphæria Peninsula until the monastery on the northern shore of the bay is open, when a vessel will be westward of the shoal.

Channel to Poros Harbor.—The channel into Poros Harbor from Poros Bay is about 1,200 yards in length and runs close along the southern shore of the Sphæria Peninsula, the main shore being bordered by a shallow bank. This channel was reported in 1891 to have a depth of 14 feet, but as the depths vary, if it is intended to pass through in a small vessel, it would be well to sound it before entering. The commanding officer of the British naval vessel *Torch*, 1874, writes: "The eastern entrance to Poros Harbor or that from Poros Bay is very tortuous, but a steamer of not more than 14 feet draft may pass through in safety. Quick helm, great attention to the soundings, and hugging the northern shore so close that the yardarms almost touch the houses is, however, required."

Small vessels bound to Poros Harbor from the southward find this channel convenient, especially when blowing fresh, saving the great

Digitized by Google

distance round Poros Island as well as being in smooth water. The shallow bank mentioned as extending from the mainland into the channel is steep-to and easily distinguished.

Water.—Excellent water may be obtained from the mainland ¾ mile to the southward of Burgi, at the foot of a lemon grove, by applying to the authorities of the town, who, except in times of great drought, will order the water to be turned on.

Modhi Islet.—This rocky islet, off the eastern end of Poros Island, is ½ mile in length, narrow, 334 feet high, and has some resemblance to a lion couchant. Some rocks lie off its northeastern end, but the water all round is deep, and there are from 12 to 45 fathoms between the islet and the Poros shore, from which it is distant ½ mile. The winds here are always baffling, caused by the highland of Poros, and the passage between is rarely used by sailing vessels.

Loney Rock, with 7 fathoms water over it, lies nearly 2 miles 85° from the northeastern point of Modhi Islet.

Platia Islet, 1.3 miles 48° from Point Akherdo, the northern extremity of Poros Island, is about 300 yards in length and only 24 feet above the sea; it is surrounded by shallow water, and at nearly 400 yards 254° from the western end is a rocky patch with only 1 fathom over it. The channel between this shallow patch and the northern extremity of Poros is clear and from 45 to upward of 120 fathoms deep.

The coast of Poros from Cape Kalauri, the eastern point of the island, trends northwestward 3 miles to Point Akherdo; it is irregular, forming a bight in which are several little bays and indentations, and steep-to, the 100-fathom curve of soundings passing both headlands at the distance of 800 yards. Between Point Akherdo and Dana Point, the western extremity of the island and the eastern entrance point to Port Pogon, the distance is 3¼ miles; the coast between forms a large bight, and the water is everywhere deep.

Port Pogon, on the southwestern side of the island of Poros, is of considerable extent and one of the finest ports in the archipelago for capacity, convenient depth of water, and shelter, being completely landlocked. It is about 3 miles in length in a west-northwest and east-southeast direction, with an average working breadth of about ½ mile. The above space may be considered to be divided into two portions, the outer and larger being Port Pogon and the inner and eastern part Poros Harbor. The depth of water throughout is from 8 to 15 fathoms.

The head of Poros Harbor is formed by the Sphæria Peninsula, on which is the town of Poros, with a small Government dockyard (at present closed). Northward of the dockyard is a small inner harbor under 10 feet deep, but which is being dredged to a depth of 12 feet. The southern shore of the port, bordered by a narrow bank, is reported

Digitized by Google

to have changed considerably since the date of the survey. A low point on this shore 1,400 yards westward from the town is conspicuous when entering the harbor, being covered with vegetation almost to the extreme edge.

The entrance channel opens northward at right angles to the port and is from 500 to 700 yards wide between bold shores, 1,200 yards in length, and with depths of from 30 to 19 fathoms.

Anchorage.—The anchorage, as affording the best holding ground, is situated with Obelisk Point bearing 107°, 500 yards.

Light.—At Dana Point, the eastern entrance point of Port Pogon, is a square lighthouse 38 feet high, from which is exhibited, at an elevation of 106 feet above the sea, an occulting white light, visible 14 miles; partly obscured. (See Light List.)

Directions.—A vessel from Athens bound to Port Pogon should give Cape Turlo, the northeastern extremity of Ægina, a wide berth to clear the dangers around it. When off Cape St. Marina, of the same island, the Petro Kargo Rocks will be seen; when abreast of Cape Andonis, which should also have a wide berth, steer for Petro Kargo Rocks and pass them at a prudent distance on either side; then bring the westernmost of these rocks to bear about 29° and in range with Cape Andonis, which will lead up to the entrance of Port Pogon. Platia Islet, which is low, will be seen on the port hand. From the southward, after passing Platia, bring the above marks in range.

At night the light on Point Dana will be seen, and a vessel may anchor where convenient, either in Port Pogon or Poros Harbor.

Measured mile beacons.—On the northern shore, close to the extremity of a projecting point 900 yards westward of the dockyard, are two obelisks close together, the one painted brown and the other white.

Another obelisk, painted white, 1 mile from the above pair lies 300 yards 344° from Dhascalia Island. The course on the range is 309° and 129°, the depth being from 8 to 15 fathoms.

Petro Kargo (Petrokaravon).—A group of 10 rocks above water, the largest being about 50 feet high, and extending over a space of about 700 yards, lies 2.5 miles north-northwestward of Platia Island. These rocks, named Petro Kargo, are easily seen, steep-to, and without known dangers, below water.

Methana Peninsula is 5 miles in extent north and south, the northern part being of the same breadth east and west, whence it tapers to the south. Mount Khelona, an extinct volcano near the center, rises to the height of 2,430 feet. On the peninsula are several villages and on its southwestern side the Acropolis and ruins of Methana. The shores are rocky, and here and there the rocks extend

Digitized by Google

a little distance off, but the water is everywhere deep at the distance of ½ mile. It is joined to the mainland on the south by a narrow rocky isthmus, formerly well fortified, the central part of which is 254 feet above the sea.

Port Steno, 2¾ miles northwestward of the entrance to Poros Harbor, is a small indentation formed between the coast of the peninsula and the northeastern side of the isthmus. The port runs in about ½ mile to the northwestward, and is available only for small vessels; the holding ground is indifferent, being chiefly loose fragments of volcanic remains.

Methana Peninsula forms with the mainland coast on the west a large bay running 5 miles southeastward, with deep water all over it. The high mountainous land around subjects the bay to heavy squalls when there is any wind. Mount Ortholithi, on the mainland, rises 3,638 feet above the sea, at about 2 miles from the western shore of the bay. There are one or two runs of fresh water on the western shore, but no anchorage.

Communication.—The steamer calling at Poros, occasionally stops off the village of Vromo, on the southeastern side of Methana Peninsula.

The village of Methana, on the southwestern side, is a telegraph station.

Port Epidavro.—At about 6½ miles westward of Methana Peninsula is the port of Epidavro, the approach between Klephti and Kalamaki Points, 900 yards apart, being open to the eastward. The space for anchoring near the head of the port is about 400 yards in extent and 2 to 3½ fathoms deep; ledges of rocks, with 8 and 9 feet water on them, extend from both of the inner points of entrance, leaving between a passage about 40 yards wide into the port which is only fit for small vessels. The range mark through the passage is Kalamaki Point, on the northern side of the approach to the port, in range with the saddle of Angistri Island bearing 66°.

The southern shore of the port is formed by a rocky peninsula on which are the ruins of *Epidaurus*, but the little modern village of Epidavro is on the northwestern shore of the port, and has a population of about 600. The land in the vicinity is highly cultivated and productive, vegetables being raised here for the Athenian market. From Epidavro to Nauplia by carriage road is about 24 statute miles.

About 5 miles inland are the ruins of the precinct sacred to Asclepios, who is said to have been born here; a theater is still in a wonderful state of preservation.

Epidavro acquired celebrity by giving its name to the constitution adopted by a general congress of deputies from all parts of Greece and promulgated on January 1, 1822. The first Greek Assembly met at Piadha, 3 miles northwestward.

Digitized by Google

Communication with Piræus is made by means of sailing vessel to Ægina, and thence by daily steamer to Piræus.

St. Lassi Bay.—The peninsula of Epidaurus forms also the northern shore of St. Lassi Bay; the cliffs of the peninsula are steep-to, but a low shore trends at a right angle to the southward and for 1,400 yards is bordered by a shallow bank which from a point 700 yards from the cliffs extends off 300 yards, with 18 to 20 feet water on its edge and depths of 10 and 15 fathoms immediately outside it.

Temporary anchorage.—In the event of having to communicate with Epidavro, there is temporary limited anchorage in fine weather during summer in the northwestern corner of St. Lassi Bay. The water is deep, and the anchor should be dropped about 250 yards southward of the cliffs and ¼ mile from the shore on the west; the soundings are from 13 to 20 fathoms, sandy bottom. Should an easterly wind set in, a vessel should leave the anchorage.

Coast.—At 4¾ miles northward of Port Epidavro is Cape Trakhyli, with an islet of the same name close to it; the coast between falls 1 mile back to Piadha Bay, the town or village of which name, with a population of about 1,100, and the old Venetian fortress are on the hill nearly 1 mile inland.

Port Sophiko.—Cape Trakhyli is the southern point of entrance to a deep bight, at the head of which, 3½ miles northwestward of the cape, is the little port of Sophiko, used by small vessels. The bottom here is mostly loose gravel, and the port being under high land, the winds are always baffling, so that it is difficult for a square-rigged vessel to get in or out.

Submarine spring.—In the deep bight which leads to this little port there is a spring of fresh water rising about ¼ mile from the shore from a depth of 7 fathoms, with deeper soundings around it; a light air is sufficient to mix the fresh and sea water.

Coast.—At 1 mile eastward of Port Sophiko is a small projection called Cape Traili; it is surrounded by rocks, some of which are above water, and steep-to. A mile eastward from Cape Traili and 800 yards from the shore is Petro-nisi, with a clear deep channel inside it; the coast hence trends north and northwestward as far as Port Franco, a distance of about 7 miles. Hevræo, which lies about 1 mile to the northwestward of Port Franco, is bluff, about ½ mile in length, and bears evidence of having once been fortified. Platia Islet lies 2½ miles westward of Hevræo, and 4 miles beyond it is the beach of Kekhries Bay. The shore all round this part of the coast is rugged, with deep water, excepting Kekhries Beach.

Kekhries Beach is steep-to, and in anchoring here a berth should be taken close in, as the land wind in summer is so fresh that the anchor is liable to drag suddenly into deep water. At about 2½ miles northward of Kekhries is Kalamaki Bay.

Digitized by Google

Ægina Island is somewhat triangular in form, its sides being about 7 miles in length and its northern side running east and west. It is generally hilly, the hills for the most part being barren, though the valleys and plains, particularly in the western part, are fertile. Mount Oros, commonly called the Peak of Ægina, near the southern end, rises 1,752 feet. Ægina enjoys a delightful climate, the atmosphere being pure and fevers almost unknown. It produces corn, cotton, wine, olives, figs, almonds, etc., and has a population of about 8,200.

Ægina was anciently celebrated for the splendor of its buildings, but the only remains are those of some tombs, vestiges of wells, a column of a temple of Venus, some moles of its harbors, and the columns of a temple supposed at one time to have been that of Jupiter Panhellenius but now said to be that of Athena. The latter ruins stand on an elevation 578 feet above the sea, near the northeastern part of the island, and its 22 remaining columns are conspicuous from seaward.

North coast.—Cape Plaka, the northwestern extremity of Ægina is beset with rocks which extend off upward of 200 yards and are steep-to; thence eastward the north coast of the island is nearly straight, with an irregular shore, here and there skirted by rocks, but the water is all along deep at a distance of ½ a mile. Near Cape Turlo, the northeastern extremity, is Nisida, a small islet surrounded and connected to the shore by rocks, as is also Cape Turlo; both should be given a wide berth.

Light.—On Cape Plaka (*Plakakia*) an occulting white light, elevated 36 feet above the sea, is exhibited from a round turret, 20 feet high, painted red and white in vertical stripes; it is visible 10 miles. (See Light List.)

West coast.—Fom Cape Plaka, the northwestern extremity of Ægina, the coast southward is bordered by a bank, and from nearly 400 yards northwestward of the bluff of Cape Skendiriotti (known by the pillar of the temple of Venus) detached rocky patches, generally with 8 or 9 feet but in places less water on them, skirt the shore southward, passing the town of Ægina and extending more than ¾ mile from Palaio Pyrgos Point, the northern point of Marathona Bay.

Town and port of Ægina.—The town and capital of Ægina, on the northwestern side of the island, is irregularly built, but has some good houses, an orphan asylum, schools, museum, library, lazaretto, etc. In its vicinity are the remains of ancient moles and fragments of a temple of Venus. The population is about 4,900.

The little port of Ægina is formed by two moles, a modern and an ancient one, inclosing a small area about 300 by 200 yards in extent, with from 2 to 9 feet water, and open to the southwest. To the north-

Digitized by Google

ward of this little port and facing the lazaretto are two other small detached moles, sheltering a cove within which has 6 to 8 feet water.

Communication.—There is daily steamboat communication with Piræus, to which also a telegraph cable is laid.

Lights.—A fixed red light, visible 5 miles, is shown at an elevation of 28 feet from the end of the northern mole at Ægina and a light is shown on the head of the southeastern mole.

A fixed green light is erected on the head of the southeastern mole. The light is exhibited 19½ feet above the mole and 20 feet above mean sea level from an iron column with a sheet-iron hut at its base, and is visible 6 miles over the whole horizon.

The light should be left on the starboard hand in entering the harbor.

Marathona Bay.—This bay, southward of the port and town of Ægina, is sheltered from the west and northwest by Angistri and Metopi Islands and shoals and from the southward by Moni Island. In the northern part there is spacious and excellent anchorage in from 10 to 19 fathoms water, mud or sand, and good holding ground. A fair berth for a deep-draft vessel is in 19 fathoms, with Palaio Pyrgos Point bearing 327°, Cape Skilomango (Angistri Island) bearing 244°, and the northwestern point of Moni Island bearing about 211° 30′; smaller vessels may anchor farther northward. The shore of Marathona Bay is skirted by rocks and shallow water, which off Palaio Pyrgos Point, extend more than ¾ mile westward.

Metopi Channel.—Metopi Island is surrounded by shallow ground which extends 1 mile eastward, leaving between it and the shoal water from Palaio Pyrgos Point a passage 800 yards wide and 5 to 6 fathoms deep. The northeastern extremity of Hypsili Islet bearing 321° and in range with the gap of Mount Geraneia leads through the passage which is called Metopi Channel; Perdika Point bearing 141°, and just open northeastward of Moni Island, also leads through the channel.

Angistri Island, with a population of about 700, is nearly 3 miles in length, the extreme breadth 1¾ miles, and its greatest elevation 709 feet. Its southern part is clear all round, but the northern part is surrounded by shallow ground connecting it to Metopi Island on the northeast; Angistri Pass, the narrow channel between, is 3 fathoms deep.

Thorussa Island off its southwestern point is rocky; the channel between with depths of from 7 to 19 fathoms is only 300 yards wide.

Vathi Channel, between Angistri and Moni Islands, is everywhere deep and clear; there is generally a light steady breeze in it, and it is the best channel to Marathona Bay.

Moni Island, 1 mile in length, is 571 feet high; between it and Perdika Point, the southwest point of Ægina, is a narrow channel

Digitized by Google

named Moni Pass, with depths of 15 to 20 fathoms, but which should not be taken unless under steam or with a strong sea breeze, as the winds are always baffling under Mount Oros, and the points of Ægina should be given a wide berth.

Light.—On the western extremity of Moni Island a group flashing light, with white, red, and green sectors, is shown, at an elevation of 75 feet, from a white iron tower 21 feet high, over a white square house. The white, red, and green lights are visible 13, 11, and 10 miles, respectively.

Kyra Islet, 1,800 yards in length, lies about 2¼ miles westward of Angistri and 1,400 yards westward of Kyra Islet is Salaphto Nisi, both being steep-to 200 yards from the shore; the passages between Angistri and Kyra and between Kyra and Salaphto Nisi are clear and deep.

Methana Channel.—The passage between Ægina, with the above islands on the north, and the Methana Peninsula, with Petro Kargo Rocks on the south, is called Methana Channel; it is everywhere deep and clear, and the shores may be approached within a reasonable distance.

East coast—St. Marina Bay.—The east face of Cape Turlo, the northeastern point of Ægina, is cliffy, and the shore for ½ mile southward is bordered by rocks; one of these rocks at a distance has the appearance of a boat under sail. During fine weather temporary anchorage will be found in St. Marina Bay, in any convenient depth, sand and weeds. This is a convenient place for visiting the temple of Jupiter; donkeys may be obtained, if required.

Cape Andonis, about 3 miles southwestward from St. Marina Bay, and Cape Pyrgos, the southern extremity of Ægina, should not be approached too near, as both capes are surrounded by shoal water; elsewhere the east and south coasts are irregular and cliffy, with little bays.

Lagosa (Eleusa) Isles.—The Lagosa Isles form a group of five small islets lying close together, nearly 2½ miles northward of Ægina; shoal water does not extend from them more than 200 yards, excepting at the eastern extremity of the eastern and largest islet, whence a bank with 3½ fathoms on it makes off 600 yards in an easterly direction. These islets are the easternmost of a chain extending over a space of 11½ miles in an east and west direction, separated from each other by deep channels, and generally steep-to.

Platia, Staktoroya, Hypsili Islets.—Two and three-fourth miles westward of the Lagosa group is Platia Islet, from which a shoal extends 200 yards to the southward; Staktoroya and Hypsili, the two next islets westward of Platia, are steep-to. Hypsili is 424 feet high, and the highest of the whole chain, and has three small islets on its western side.

Digitized by Google

Diaporii is the name given to the principal islets of the westernmost group of this chain; they are Agios Ioannis, Agios Thoma, and Trago Nisi, respectively 254, 137, and 253 feet high; these three islets are close together and there is no vessel passage between them. Three little islets are scattered from about ¼ mile to 1 mile eastward of them.

Shoals.—Between the eastern end of Agios Ioannis and Molathi (the eastern of the little islets of this western group) are two shoals; one ¼ mile from Agios Ioannis has ½ fathom water on it, and the other, about the same distance from Molathi, 4½ fathoms, with deep water around. There is nothing to invite a vessel near these dangers.

Kalamaki Bay (ancient Schœnus) in the northwestern corner of the Gulf of Athens and on the eastern side of the Isthmus of Corinth, may be said to be contained between Cape Sophia on the west and Susaki (Sparta) Point on the east, these points being 2 miles apart. The bay affords accommodation for vessels of all sizes, in from about 6 to 19 fathoms, sand or mud bottom. It is open from about south by east to east-southeast, but not exposed to much sea, though subject to very heavy squalls from the highland around it, especially from the northward, and at times these blow so furiously as to part a vessel's chain. In approaching the bay, the Acro-Corinthus, a bold magnificent object, will be seen to the westward, rising 1,941 feet above the sea, on the south side of the lowland that separates the Gulf of Athens from that of Corinth. Kalamaki Village, with only a population of about 225, is on the northern side of the bay.

Kalamaki Bay is of especial importance owing to its connection with the Gulf of Corinth by the canal of this name.

Light.—A fixed red light is exhibited from Susaki (Sparta) Point at an elevation of 30 feet above the sea, and visible 8 miles. The lighthouse is a cylindrical masonry tower, 25 feet high, with keeper's dwelling adjoining.

Anchorage.—The usual anchorage is in 16 or 17 fathoms water, sandy bottom, with the village of Kalamaki bearing about 6°, ½ mile; Susaki Point Lighthouse, bearing about 98°; peak of Ægina just open northward of Hevræo Islet 121°; and the northern extremity of Acro-Corinthus 266°. Vessels may also anchor in 10 to 12 fathoms, ¼ mile north-northwestward of this, and small vessels may anchor in 6 fathoms, mud bottom, off the pier of the village of Kalamaki.

Isthmia, a small but important town stands on the northeastern side of the entrance to the canal from Kalamaki Bay and a ferry connects it with the opposite bank of the canal; it is the principal station of the canal, and here are situated the health office, customhouse, post office, and telegraph office.

Digitized by Google

Corinth Canal.—This great engineering work follows almost exactly the line of the canal commenced, but never completed, by Emperor Nero 1,800 years ago. The present canal was commenced in 1882 and opened by the King of Greece on August 6, 1893.

Corinth Canal is the shortest way for vessels sailing from the Adriatic Sea and ports of Austria, France, and Italy, to the Aegean Sea and ports of Turkey, Roumania, Russia, and Asia Minor.

Dimensions—Depths.—The canal is straight in a northwest and southeast direction and is 3 statute miles 1,610 yards in length. The northwestern portion of the canal for a distance of 1,280 yards and the southeastern part for a distance of 933 yards were dredged, and are 98 feet wide at the water line, 72 feet at the bottom, with a depth of 25½ feet. The remainder is a cutting through the land (the summit of which was 250 feet above the level of the sea) and is faced with masonry; it is nearly 81 feet wide at the water line, 69 feet at the bottom, and has a depth of about 26 feet 3 inches. The railroad from Athens to Corinth and Patras crosses the canal by a bridge, the height of which from the water to the lower surface of the principal beams is 147 feet 8 inches.

The canal is available for vessels whose draft does not exceed 23 feet 6 inches and whose breadth is not more than 65½ feet.

Large vessels are recommended to take two tugs, and not to enter the canal from the westward during squalls, which are frequently very heavy, and the western entrance is very narrow.

British naval vessel *Tyne*, 3,560 tons, passed through the canal in 1905 with one tug and no pilot.

The Orient steamship *Lusitania*, length 380 feet, breadth 41 feet and a tonnage of 3,877 tons, has passed through the canal.

British royal yacht *Osborne*, with an extreme beam of 64 feet 2 inches, passed through on the night of May 2, 1899, under her own steam, a tug also towing ahead.

None of the foreign steamship companies navigating the Mediterranean now use the canal; it is mostly used by small Greek passenger steamers.

Moles.—The entrance to the canal on the Corinth side is protected by two moles, forming the port of Poseidonia, the heads approaching one another, and leaving a passage 80 yards wide.

The southeastern entrance in Kalamaki Bay is protected by a single breakwater curving from the shore northeastward of it.

Lights.—The end of the northeastern mole at Poseidonia is marked by a fixed red light and the end of the southwestern mole by a fixed green light. The mole at Isthmia is marked by a fixed green light and the opposite entrance point by a fixed red light. In addition to these, there are 56 white electric (or ordinary oil) lights arranged in pairs on either side of the canal. (See Light List.)

Digitized by Google

Bollards are placed along the sides of the canal about 110 yards apart to assist vessels keeping in the middle of the canal.

Tides.—It is high water, full and change, approximately at 5 h.; springs rise 10 inches, neaps are irregular.

Currents.—The movement of the water in the canal is dependent entirely on the wind and its effect in holding up the water either in Corinth or Kalamaki Bay. The general rate of the stream is 1.5 knots, and seldom exceeds 2 knots. There is a range of 5 feet in the level of the sea at Poseidonia and 3 feet at Isthmia. Sometimes a set across the entrance at Poseidonia is experienced.

A signal can be made by prearrangement when the current is most favorable—that is, contrary—but the authorities do not consider there is any necessity to wait, though they recommend large vessels in any case to employ tugs.

Current signals.—The following signals are shown from the flagstaff at each end of the canal:

In the daytime two triangular white flags; at night a red light over a white light, signify that the current follows the same direction as the entering vessel.

In the daytime a triangular white flag; at night two vertical red lights, signify that the current is opposite to the direction of the entering vessel.

No current signal at all at the flagstaff signifies that there is no current.

Directions.—As may be gathered from the foregoing remarks, the best time to navigate the canal, especially with large vessels, is when the stream is adverse, as they will be more under command. Vessels can not pass one another in the canal, as there are no sidings.

The prevailing winds in the canal are northwest (or in the direction of the canal), next follows an east wind, and lastly north. These require much attention when entering from the Poseidonia side. All ships towed must furnish their own hawsers.

Provisional regulations for navigating the canal.—Masters of vessels shall conform to the regulations, obey all signals mentioned therein, and comply with any requisition made to them to execute the regulations. A copy of the regulations will be supplied to them on demand. (These regulations are liable to alteration, and a copy should therefore always be obtained from the local authorities.)

The transit through the Corinth Canal is open to vessels of all nationalities, provided their draft of water does not exceed 23 feet 6 inches and that they are of not more than 65½ feet beam.

Sailing vessels of 4 tons or more must be towed through. Steamers may pass through the canal under their own steam or be towed.

The canal authorities are not compelled to tow steamers, but if there are tugs unengaged it will be done.

Digitized by Google

The speed of vessels must not exceed 6 miles an hour.

Masters of vessels passing through the canal must pay all dues for passage at the entrance, and, when necessary, those for towage and pilotage. Payment is made on the net register tonnage (Suez canal certificate) and is collected at either end. They must also give the following information in writing:

Description of the vessel. Name and nationality of the vessel.

Name of the master. Name and address of the owners.

Port of sailing. Port of destination. Draft of water.

Number of passengers, to be ascertained from the passage list.

Number of the crew. Tonnage and nature of the cargo.

Net tonnage to be ascertained by the vessel's official papers and the rules of the International Tonnage Commission assembled at Constantinople in 1873.

The canal authorities determine the time of departure and the stoppages of each vessel. No vessel can enter the canal until the permission of the captain of the port has been received.

By day a blue flag and by night a white light signify that the passage is clear. A red flag, or two white lights, that the passage is not clear.

All vessels preparatory to entering the canal must have their yards braced up and boats swung inboard. In addition to two bow anchors a kedge with a hawser bent to it, strong enough to hold the vessel, must be carried at the stern ready for letting go.

Vessels navigating the canal by night must carry, besides the regular lights, a white stern light. When towed, only the vessel being towed carries the light, and if more than one vessel is towed, only the last vessel carries the stern light. In the event of grounding, the canal authorities shall have the right to direct all operations for floating the vessel, and, if necessary, to unload and tow her at the expense of the vessel. The cost of floating, towing, discharging, and reloading must be paid before the departure of the vessel.

The following acts are prohibited in the canal:

Anchoring a vessel except under unavoidable circumstances.

Throwing overboard cinders, ashes, or material of any kind.

Firing guns on board vessels.

All vessels must furnish their own warps and vessels being towed must use their own propelling power or have it in readiness to assist the tug. Vessels can be towed by tugs not belonging to the Canal Society, but such tugs must pay the dues to which ordinary vessels passing through the canal are subject, except when going through the canal to meet vessels of their owner which they intend towing, or when returning to their usual berths after having towed a vessel through.

All vessels towed must furnish their own hawsers.

Digitized by Google

Communication.—Kalamaki village is connected with the railroad and telegraph system of Greece.

A telegraph cable from the Piræus is landed near the village of Kalamaki, and another cable proceeds from the other side of the isthmus to Patras.

Megara Bay.—From Kalamaki village the coast eastward is bold, being the base of Mount Geraneia, which at 4½ miles inland rises 4,494 feet high. Theodoro Point, ½ mile northeastward of which is a little church of the same name, is 5½ miles from Kalamaki; between this point and Salamis Island the coast falls back to the northward, forming an indentation which takes the name of Megara Bay from the town of this name, situated on a hill 1¼ miles from the shore and 3½ miles from the northwestern extremity of Salamis Island. This town has a population of about 6,500, and is connected by railroad with Athens and Corinth. In the bay there are no outlying dangers and the water is everywhere deep, but precaution is necessary when under sail to guard against the heavy squalls during strong northerly winds.

Anchorage.—Anchorage may be obtained northeastward of Paki Island, but the water is deep. Pakiaki is joined to the mainland by a causeway, alongside which steamers lie.

Telegraph.—The town of Megara is a telegraph station.

Salamis or Koluri.—This singularly shaped island occupies an extent of 8½ miles east and west and 8 miles north and south, with an irregular coast line forming numerous bays, inlets, and projecting points. Its eastern and northwestern extremities are separated from the mainland by narrow winding channels, inclosing on the north the beautiful Bay of Eleusis. The island is hilly, and near the center is Mavro Vuni, 1,270 feet high. Its surface is rocky, with a thin but not unproductive soil; the vine thrives and the other principal product is honey. The population of the island is about 6,600.

Light.—A flashing white light is shown, at an elevation of 111 feet, from a cylindrical masonry tower, 39 feet high, on Cape Konkhi, the southern point of Salamis Island; it should be visible 16 miles.

Koluri Bay, on the western side of Salamis Island, is 1¾ miles wide at the entrance between Cape Petrite on the south and Rhevituza Islet on the north, running in 5 miles to its head, where the anchorage space is much contracted by shallow water. The village of Koluri is on the northern side and near the head of the bay. A vessel may anchor southward of a little chapel, situated about ¾ mile westward from the village, in about 8 fathoms water, or farther out as convenient.

Mastiff Bank.—This bank, nearly in the middle of the entrance to Koluri Bay, is about 1,300 yards in length northwest and southeast

Digitized by Google

and the general depths over it vary from 11 to 19 fathoms, but on its northwestern part is a rocky patch with 4 fathoms only situated 1 mile 1° from Cape Petrite. The mill or the chapel at the head of Koluri Bay, kept well open of the northern shore, leads southward of the 4-fathom patch.

A patch of 5 fathoms lies nearly 800 yards from the eastern shore of the bay, bearing about 6°, 1 mile from the little village of Mulke.

Supplies, water.—No water or supplies can be obtained in Koluri Bay.

Eleusis Bay.—This splendid bay, which appears almost like a lake, is about 8½ miles in length east and west, with an average breadth of 2 miles, and derives its name from the ancient town on its northern shore. The depths throughout are from 7 to 18 fathoms, and the bottom is remarkably level. The shore is bordered generally by a narrow bank, and ¼ mile off the northern extremity of Salamis Island is a shoal with 1½ to 3 fathoms water on it. There is no fresh water to be obtained, the springs which supply the mills at Rheiti on the eastern shore being strongly impregnated with niter. The approach to Eleusis Bay, at the northwestern end of Salamis, is fronted by islets, which with a long tongue of land from the main overlapping the projecting northwestern extremity of Salamis forms a narrow tortuous channel into the bay, through shallow water, the greatest depth over the mud being about 13 feet. This passage was blocked by Xerxes, the night before the battle of Salamis, with 200 Persian vessels, at the suggestion of Themistocles. The eastern approach to the bay is through Salamis Strait and Georgio Channel, with 4 fathoms of water.

Telegraph.—The town of Eleusis is a telegraph station and is connected by railroad with Athens.

Lipso Island (ancient *Psyttalia*) is about nine-tenths of 1 mile in length, 155 feet high, with the lighthouse and some white tombs resembling beacons on its northeastern end. At 700 yards westward of the southwestern extremity of Lipso is Atalanta Islet, and ¾ mile beyond in the same direction is Propetes Rock, above water. Very shallow water surrounds the islet and rock to the distance of 150 yards, in addition to which nearly the whole space between the islet and rock is occupied by a reef, with from 3½ to 4 fathoms water, passable only by small vessels. The passage between Lipso and Atalanta Islet, and also between Propetes Rock and Salamis, is clear and deep, and may be used with a fair steady breeze or under steam, if convenient.

Light.—On the northeastern part of Lipso Island is a circular gray stone tower 46 feet high, from which a fixed and flashing white light is exhibited at an elevation of 185 feet above the sea; it is visible 19 miles. (See Light List.)

Digitized by Google

Batteries.—On Lipso Island batteries protected by earthworks and mounting modern guns have been erected on the northeast and southwest ends, also two in the center of the island on commanding heights about 500 yards apart; other forts have also been erected on all the commanding positions of Salamis Strait and the entrance to the Piræus.

Salamis Strait, between the eastern coast of Salamis Island and the main, affords excellent anchorage for a large number of vessels, over a space of about 1½ miles east and west by ¾ mile north and south, in depths from 12 to 18 fathoms, sand and shells.

Salamis Bay is protected on the south by a long tongue of land projecting eastward from Salamis Island, and by Lipso Island, and the islets, rocks, and reefs west of it, which add considerably to the shelter.

A conspicuous building, painted white with a red roof and surrounded by a wall, is situated on the summit of the northwestern point of Karrachin Bay.

Shoals.—In the western part of Salamis Strait and 750 yards eastward of the northern point of Ambelaki Bay is a shoal, with 3 fathoms water over it, which should be avoided by large vessels anchoring in this part of the strait.

In the entrance to Karrachin Bay and 800 yards to the southeastward of the conspicuous white building referred to above is a small island surrounded by shallow water for a distance of about 200 yards.

The depths on the northern shore shoal gradually, but the southern shore is steep excepting at Sedukia Point, from which shoal water extends for about 60 yards, with sand and rocky bottom.

Anchorage.—Vessels may anchor where convenient, but if any stay is to be made it will be necessary to moor, as during strong northerly or northwesterly winds in winter very heavy squalls blow from the high land, sweeping the surface of the water before them.

Supplies—Caution.—No fresh water can be obtained from the adjacent shores at the anchorage in Salamis Strait; all supplies must be obtained from the Piræus, and as strong southerly winds frequently cause a heavy sea between the two places, a berth should be given by boats to the rocky points on the northern side of entrance to the Piræus. Water will, however, be sent from Piræus, in tanks.

Georgio Channel.—The passage into Eleusis Bay, on the eastern side of Salamis Island, is called Georgio Channel, which eastward of Georgio Nisi is only 300 yards wide between the 3-fathom curves on either side and carries 3¼ to 4 fathoms water.

Buoys.—The Georgio Channel is marked by three conical buoys on each side.

Beacon.—A tower is built on a small rock near the northern end of a 1-fathom bank on the eastern side of the channel.

Digitized by Google

Shoal.—A 3-fathom patch lies 400 yards 17° 30′, from the northern point of Georgio Nisi.

Dockyard.—A Government dockyard of considerable importance is situated on the eastern side of Salamis Island, ¼ mile to the southward of Arabi Point. Immediately south, and detached, is a smaller yard containing a torpedo school and launching slips for a flotilla of torpedo boats of various sizes.

Floating dock.—A floating dock, 308 feet in length, 61 feet internal width, and 21 feet depth on blocks, capable of lifting a vessel of 3,000 tons, is moored off the arsenal. The largest vessel taken into the floating dock, was the steamer Sindh, 3,121 tons, 372 feet long, 39.4 feet broad.

Light.—From a lamp-post under the director's house, on the north point of dockyard cove, is exhibited a fixed white light. (See Light List.)

A basin entering from the southwestern corner has been excavated suitable for the loading and unloading of stores from barges and lighters, and it is proposed to make the basin available for vessels.

Sheers.—There is no sheer hulk, but there are large sheers on a properly constructed pontoon, which is capable of being moved from one position to another, as required.

Piers.—A stone pier extends in a 168° direction nearly for 390 feet from the director's house alongside which a vessel of moderate draft can lie. A stone pier extends about 400 feet in an easterly direction from the point near the torpedo school.

Quarantine.—This establishment is situated on Georgio Nisi, which is connected by submarine cable with Salamis Island.

Mooring buoys.—Five mooring buoys have been laid out for adjustment of compasses in the bay between Arpedoni and Karathes Islands.

Ferry.—A sailing ferryboat crosses from Salamis to the mainland, the starting place on the Salamis side being close southward of the southern dockyard.

The Piræus or Port Drako—(The Piræus or harbor of Athens is also called Porto Leone, from the colossal marble lions which once crowned the two pillars forming the entrance, and which were about 72 yards apart.) Is a landlocked basin, with anchoring space limited to about 900 yards northeast and southwest by a little more than 500 yards in a transverse direction; consequently it is necessary for vessels to moor, but it is advisable to have only about 35 fathoms of cable each way and open hawse to the northward, the strongest winds being from that quarter. With the exception of a bank in the center of the port that has been dredged to 27½, the depths vary from 21 feet in the northeastern part to between 40 and 50 feet in the southwestern portion. Dredging operations are

Digitized by Google

in progress to deepen the water over this central bank, as well as over the flats which fringe the shores.

Large vessels moor with their sterns secured to, and distant about 80 yards from the South Quay wall, where at about every 10 yards are large iron rings, to which the quarter hawsers or cables are secured, the bower anchors being well apart to the northward. Deep draft naval vessels should, if possible, communicate beforehand by telegram or otherwise with the captain of the port as to the proposed arrival of the vessel, when he will, if possible clear a berth. Merchant vessels generally moor with their sterns to the shore, and along both sides of the port are stone bollards, iron bars, or shackles for this purpose, but not strong enough for large naval vessels. The head-gear should be ready to be run in at any moment. The port is generally full of shipping, amongst which are often several naval vessels of different nations, and it is necessary to avoid over-laying the cables. The center of the harbor is kept clear.

Cape Themistocles, the most westerly projection of the promontory upon which the Piræus stands, is 700 yards southwestward of Cape Miaulis, and between them the 5-fathom curve follows the shore round at a distance of 150 yards. A large orphan asylum, very conspicuous from seaward, is situated on the heights above Cape Themistocles.

Breakwaters.—A breakwater about 300 yards long extends in a southerly direction from Cara Krakari and another about 400 yards in a northwesterly direction from Cape Themistocles, called King George I Breakwaters.

Spit.—On a point ½ mile above Cara Krakari is situated a boat-house, and from its southeastern extremity a spit extends 70 yards 158°; marked by a light.

Shoal from South Quay.—From the angle of South Quay, 200 yards eastward from the southern entrance point of the port, depths under 30 feet extend in the direction of the spit extending from the point on the northern side of the inner entrance to the harbor, 60 yards, leaving in the channel between the two a depth not less than 30 feet, with a breadth of about 130 yards.

Alongside the South Quay there is at places a depth of only 1 foot.

Lights.—About 22 yards from the extremity of King George I (Themistocles) Breakwater two fixed green lights, placed vertically, are shown, the upper one being 40 feet above the sea. Vessels should pass at not less than 45 yards from the said lights, in order to avoid the end of the breakwater. (See Light List.)

From the end of Cara Krakari, King George I Breakwater, two fixed red lights, placed vertically, are exhibited at an elevation of 36 feet.

The breakwater lights are unreliable.

Digitized by Google

A fixed red light is shown from an iron support, 28 feet high, near the end of the spit, on the northern side of the inner entrance to the harbor.

A fixed green light is shown, at an elevation of 26 feet, from a square white tower, 15 feet high, on the western end of the South Quay.

Harbor works—Docks and repairing facilities.—Extensive harbor works, slips, and two dry docks are on the northern shore, between Cara Krakari and the same harbor.

The lengths of the docks are 462 and 323 feet, widths 69¾ and 51 feet, depths 29 and 26 feet, respectively. There is a slip capable of taking a vessel of 3,500 tons, and four floating cranes, one at least capable of lifting 10 tons.

There is also a floating dock at Salamis (distant some 7 miles), the property of Government, and a patent slip, situated at the harbor entrance. For details, *see* Appendix I.

The workshops attached to the patent slip are fitted with the latest plant. There are seven engineering and repairing shops established, and of these three are of importance, and capable of carrying out almost any class of marine work.

Pier.—A stone pier with a depth of 24 feet at its end has been constructed on the northwestern shore of the inner harbor.

The inner port (ancient Cantharus) is generally crowded with small craft; it is being much improved and deepened by dredging.

Directions.—In approaching the Piræus the highland of Mount Ortholothi, 3,638 feet high; Mount Khelona, 2,430 feet, on the Methana Peninsula northeastward of it; and farther on in the same direction Mount Oros, or the peak of Ægina, will all be seen to the westward. As the latter peak is brought to the southwest and southward, Mount Khelona will appear above it, which will again be overtopped by Mount Ortholithi; while to the northeastward of the peak of Ægina will be seen the lofty summits of Hymettus. These elevated heights rise nearly northeast by east and southwest by west of each other.

Special directions for the Piræus are almost unnecessary, the chart being a sufficient guide. From the southward the peak of St. Georgio Island; Mount Oros, or peak of Ægina; and Mount St. Elias (Cape Colonna), being near marks, will each be easily recognized. In running up the gulf, when abreast of Ægina, the land of the Piræus will appear like an island with white and reddish cliffs, and a windmill situated on the hill with the flagstaff on it 195 feet high, immediately over the port. The Acropolis and buildings about Athens will be seen on the east and the lighthouse on Lipso Island on the west, which will indicate the entrance to the port.

Digitized by Google

As the Piræus is generally crowded with shipping, it would be prudent in a large vessel to send a boat in to mark with buoys the position for the anchors before entering, if arrangements have not already been made with the captain of the port to clear a berth. The entrance between King George I Breakwaters is about 1¼ miles eastward of Lipso Island Lighthouse; thence to the narrows it runs in ½ mile, and in large vessels under sail, unless with a fair wind, the port is difficult of access, the channel at entrance to the inner harbor being narrow, and with a southerly wind, necessary to haul up southward of 85°.

At night the fixed and flashing light on Lipso Island on the west and the lights on the ends of the breakwaters will denote the entrance.

Caution.—From the crowded state of the shipping in the Piræus, it would be well to consider as to the advisability of naval vessels remaining for any length of time in the port, unless in cases of necessity, or during the winter months, as it receives the whole of the drainage from the town, which is increasing in size, and there is no tide and but a small outlet; in summer bad cases of fever occur.

Pilotage is not compulsory.

The town along the northeastern side of the Piræus is well laid out, extending and rapidly rising in importance; the population is about 70,000, and of Athens 170,000.

The health of the town is not good, the water supply being defective, and smallpox and typhoid fever are prevalent.

Industries, trade.—Several cotton, cloth, chair, soap, and dyeing factories are in active operation, also distilleries and iron foundries. The principal articles imported are coal, grain, the finer kinds of cloth and cotton textiles, hardware, timber, dried fish, and groceries. The chief exports are rawhides and cognac.

Communication.—There is communication by rail with Athens and thence to Corinth, Patras, Nauplia, and Tripolitza on the west, to Lavrion on the east, and to Bralo on the north. The latter line is to be extended to Larissa.

The railroad station is near the northeastern corner of the inner port, whence frequent trains run to Athens and Phalerum.

There is telegraphic communication to all parts in connection with the Eastern Telegraph Co.

Regular established lines of steamers run frequently to all parts of the Mediterranean and Black Sea.

Telegraph cables are laid to the isthmus of Corinth, Syra, and Ægina.

Docks and repairing facilities.—There are two dry docks—one floating dock at Salamis (distant some 7 miles), the property of Government and capable of lifting 3,000 tons, and a marine railroad dock, situated at the harbor entrance. The latter dock is of the

Digitized by Google

more modern type, and is capable of lifting a vessel of 4,000 tons. The workshops attached are fitted with the latest plant. The two dry docks under construction by the harbor board are nearly completed. There are seven engineering and repairing shops established, and of these three are of importance and capable of carrying out almost any class of marine work.

Repairs to machinery and boilers of large vessels can be effected by the Vulcan Engine Works (Messrs. McDowall & Barbour), or at the works of Mr. Const. G. Basiliades. The sheers at the Vulcan Engine Works are constructed to lift 30 tons.

Supplies.—No good water is obtainable. The town is well supplied with provisions.

Coal.—About 300,000 tons of coal are imported annually and about 45,000 tons of coal (principally Welsh) are kept in stock by the different firms. Coaling is performed by lighters alongside; these lighters carry from 10 to 70 tons, and about 800 tons can be put on board in an ordinary day's work.

Sailors' Home.—This excellent institution was established a number of years ago, and it is so much appreciated that it has been visited by some 2,700 sailors and others in one year.

Winds.—The strongest winds during winter are from the northward, or between northwest and northeast, frequently accompanied by heavy squalls, sleet, and snow. Should the wind be at southwest, and veer round to northwest and north, with the barometer rising, a gale from the northward may be expected. In June and July strong northerly winds occur in the Gulf of Athens every week or 10 days and last for 2 or 3 days; gales from the northeastward usually last 3 days. During the summer months the southwest winds are most prevalent, when the sea breeze blows nearly all day, and in the afternoon directly into the harbor. December and January are usually attended with heavy rain.

Port Passalimani (ancient *Zea*) is situated on the eastern side of the Piræus Peninsula and has depths of from 5 to 12 feet, but dredging is in progress. During the summer months vessels may anchor off this port, in 14 fathoms water, sand and mud, with the south peak of Salamis, Mount Konkhi, open, bearing about 254°, entrance to the port 338°; and Stalida Islet 31° 30′, distant ½ mile. A small vessel may anchor a little farther in; the bottom is sand, mud, and weed.

Port Castela—Light.—A fixed green light, elevated 26 feet above the sea and visible 3 miles, has been established on a rock located 55 yards 207° from the northern entrance point to Port Castela.

The light is exhibited from an iron staff 13 feet high on a masonry base.

Digitized by Google

Pier.—On the western side of Port Castela is a stone pier about 100 feet long.

Phalerum Bay.—In the western part of Phalerum Bay is the town of Phalerum, near which is Actaeon Hotel, a large building with a dome. The town is in communication by rail with the Piræus and Athens, and a large number of persons resort here in the summer for the purpose of bathing.

Landmarks.—In addition to the hotel above mentioned the following buildings are conspicuous: A pink house on the 262-foot hill northwestward of Port Castela; two chimneys, each 213 feet high, belonging to the Hellenic Paper Factory, at the back of Phalrum; and a conspicuous white house about midway between Cape Colias and Kosma Point.

Light.—A fixed red light is exhibited from a red beacon, 15 feet high, 560 yards 104° from the southwestern extremity of the landing pier, to mark the end of the discharge pipe from the condenser on shore.

A shoal, with 16 feet water on it, lies nearly ¼ mile 315° 30′ from Cape Colias on the eastern side of the bay.

Bank.—A bank, with 7½ fathoms least water on it, lies 1.1 miles 214° from the same cape.

Not more than 3 fathoms will be found ¼ mile from the head of Phalerum Bay.

A fair berth in Phalerum Bay is in 9 fathoms, with the rock at the entrance of Port Castela (ancient *Munychia*) bearing about 293° a little over ½ mile. Small vessels anchor farther northward, in 5½ or 6 fathoms.

Summer anchorage.—Naval vessels anchoring in Phalerum Bay in summer will escape the heat and the unpleasant smells of the Piræus.

British naval vessel *Aboukir* reported in 1910 the best anchorage to be 1,600 yards, 185° 30′ from Actaeon Hotel. To the eastward the ground is hard and the vessel dragged.

Provisions are obtainable at reasonable prices.

Telegraph.—Phalerum is a telegraph station.

Kosma Point is situated 2½ miles to the southward of Cape Colias.

A patch with 2 fathoms on it lies about 1,400 yards 180° 30′ from Kosma Point and nearly ½ mile offshore.

Vessels cruising along this shore should give it a wide berth, and pay attention to the lead.

Rock Point.—At a distance of about 550 yards, 243° from the southwestern extremity of Kosma Point is a rock with 5 feet of water on it.

Port Aliki.—This little bay is about 5½ miles southward of Phalerum Bay; the shore between is irregular, rocky, and bordered by shallow water, which under the depth of 3 fathoms extends in several

Digitized by Google

places 600 yards from the shore. Port Aliki is small, with about 2 fathoms water, and fit only for small coasters during the southerly winds. During fine weather in summer there is temporary anchorage off the port, in any convenient depth, sandy bottom and fair holding ground.

Aliki Rocks, upon which the sea always breaks, lie nearly 1,400 yards southwestward of Aliki Point and nearly the same distance from Praso Nisi. There are 10 fathoms water close outside and 7 fathoms between them and the shore. The rocks are resorted to during summer for sponges.

Praso Nisi (ancient *Hydrusa*) lies ½ mile offshore, to which it is connected by a 2½-fathom ridge. In the bay between Aliki Point and Cape Kavura the bottom is very uneven and it is not recommended.

Vuliasmeni Bay.—Kavura Point is the termination of a narrow projection extending westward, with a round rock close to it; between the point of Cape Zervi (ancient *Zoster*), the southern termination of Mount Hymettus, is the peninsula of Lombarda, united to the coast by a sandy neck and having a large rock above water off its southern end. Lombarda Peninsula forms the western side of Vuliasmeni Bay, which has a beach at its head, is open to the southward, and fit only for small vessels during summer.

Mount Hymettus.—The highest part of the Hymettus range, Trelo Vuni, is 3,360 feet above the sea, and 2½ miles to the southward is Mavro Vuni, 2,560 feet high; thence the range declines in height to Cape Zervi, the southern termination, 9¼ miles from Trelo Vuni. A mountainous district trends to the southeastward from the southern part of Hymettus to Mount Korphona (ancient *Laurium*), which terminates at Cape Colonna, and the western slopes of the heights bound the northeastern side of the Gulf of Athens.

Phleva Island (ancient *Phaura*), 244 feet high, is 1 mile in length north and south, with an irregular coast line, and an islet or rock at its southern end and another close to its northern end. The passage between the latter and the rock off the extremity of Lombarda Peninsula, ¼ mile wide, is deep and clear.

Light.—An occulting white light is shown, at an elevation of 266 feet, from a square masonry tower 22 feet high, on the summit of Phleva Island; it should be visible 12 miles.

Vari Bay, on the eastern side of Cape Zervi, is about ¼ mile deep, with a beach at its head, and sheltered from the westward by the land of the cape, but completely exposed from the southward. A vessel might, however, anchor here for any temporary purpose under favorable circumstances during summer.

The bight between Cape Zervi and Arsida Island (ancient *Eleusa*), 7¼ miles southeastward, is encumbered with shoals and rocks covered and uncovered, with a coast line broken by several rocky points;

Digitized by Google

it is therefore advisable not to pass within the line joining the cape and island just mentioned. Mount Olymbos, 1,610 feet high, is about 1½ miles inland from the southeastern part of the bight.

Port St. Nikolo, with salt works at its head, about 1 mile eastward of Arsida Island, is fit for small vessels during summer, but, being open to the southward and southwestward, is not safe in winter.

Gaidaro Island (*Patroclos*), 1½ miles in length east and west by about ¾ mile in breadth, and 820 feet high, is uninhabited; a few partridges and quail may be shot, and there is good seining in the sandy coves on its northeastern coast. The island is separated from the mainland by a passage with a depth of 6 fathoms and rather more than ½ mile wide; its northern side is bordered by a bank, and nearly midway between the eastern part of the island and the main is Medina Rock, with ½ fathom water on it. The point of the mainland, at the eastern entrance of the passage, is foul. Mount St. Elias rises 1,195 feet above the sea, 2¼ miles northward of the point.

British naval vessel *Flamingo*, in October, 1878, found good anchorage, muddy sand, and weed, with the southeastern extremity of Gaidaro Island bearing about 152° and the northwestern extremity of the island 248°.

Cape Colonna (Sunion).—At rather more than 3 miles eastward of Gaidaro Island is the promontory of Sunion, better known by the modern name of Cape Colonna, from the ruins of the temple of Minerva on its summit close over the sea. The temple, of which 12 Doric columns of white marble still remain, was part of a strong fortification, and the walls are still traceable in nearly all its circuit (which is more than ½ mile long), except in parts where the steep cliffs needed no defense. The hills in the interior are in the silver mine district of Sunion, and at 6 miles inland Mount Korphona is 1,230 feet high.

Legrana Bay, between Gaidaro Island and Cape Colonna, may be easily known by its sandy beach. This is a good stopping place and frequently resorted to when strong winds from the northward or northeastward, combined with a southerly current, render the passage for sailing vessels through Zea and Doro Channels impracticable. The anchorage is in any convenient depth, sand and weed.

Port Colonna.—The little bay called Port Colonna, on the western side of the cape, affords accommodation for one or two small vessels during northerly winds; the depths are from 8 to 3 fathoms, and the bottom coarse sand and fair holding ground. During offshore winds hematite iron ore is loaded by steamers from an iron pier, 125 feet long, erected on the eastern side of the port.

Mandri Channel.—Makronisi forms with the rugged and irregular coast which it fronts Mandri Channel, the narrowest part of

Digitized by Google

which, at Cave Point, 3 miles from Cape Colonna, is about 1½ miles wide. The dangers to be avoided are Pasha Rock, Makri Reef, and Tripiti Rock, off the northern extremity of Makronisi; with these exceptions, the shore may be approached on either side within ½ mile.

Pegathi Point bears 45° 30′, 2½ miles from Cape Colonna, the coast between forming Panorimo and Pasha Bays.

Pasha Rock.—This danger, with less than 1 fathom water on it is the outer of the rocks skirting the irregular coast northeastward of Cape Colonna. It lies about 1.7 miles from the cape, a little without the line joining it and Pegathi Point, and about 400 yards from the rocks above water on the southern side of Pasha Bay. After rounding Cape Colonna the coast should not be hugged too closely; Pegathi Point bearing northward of 29° will clear Pasha Rock.

Cave Point is about ½ mile northeastward of Pegathi Point, and, as before stated, is the nearest part of the mainland to Makronisi.

Light.—On Cave Point is an iron lighthouse, from which a fixed red light elevated 39 feet above the sea is exhibited, and visible 8 miles.

Ergasteria (Lavrion) Bay is situated 1½ miles northward of Cave Point. The town, which has a population of about 10,000, owes its prosperity to its being the principal port of shipment of ores brought down from the valuable silver, zinc, lead, galena, and iron mines in the Sunion district, and to facilitate which a railroad is carried as far as Kamaresa, with branch lines to various points.

Ergasteria Bay is about 800 yards wide and long, open to the eastward, and has a depth of 8 to 3 fathoms water over muddy but indifferent holding ground. Shoal water is said to extend to a distance of fully 200 yards from the southern shore, which vessels are recommended to keep 300 to 400 yards from.

On a hill at the southern side of the port is a large conspicuous factory chimney, an excellent mark in approaching the port either from the northward or southward. On opening the bay the town, with large storehouses, will be seen, and on a hill above it a small Greek Church. The winds from the northward at times blow with great violence and at all times of the year.

Furnaces and smelting houses are situated at the head of the bay, where two piers have been constructed, from which steamers ship he ores; the depth alongside being from 17 to 20 feet.

Wreck.—The wreck of the steamship *Solano* lies sunk in the entrance to the bay 880 yards from the eastern extremity of the quay, has been removed, but an examination of the site of the wreck shows that some portions remain, over which the depth is 27 feet.

Rock.—A rock with a depth of 23 feet over it is reported to be situated ¼ mile 135° from Ergasteria Point.

Digitized by Google

Pilots.—Pilotage is not compulsory, but there are a few authorized pilots, who are very useful in taking vessels alongside the piers.

Repairs.—There are two companies who can execute small repairs to machinery.

Coal and Supplies.—Coal can be supplied at the port of Lavrion, in Ergasteria Bay, and can be loaded at the rate of 100 tons an hour. There are also machinery workshops capable of undertaking repairs to vessels.

Water.—A tank carrying from 15 to 20 tons of water supplies shipping, but it is reported to be rather brackish.

Communication.—Ergasteria or Lavrion (Laurium) is a telegraph station. Railroad trains run twice daily to Athens. Steamers from Piræus to Volo call daily. The Frassinet Company's steamers call here fortnightly on their passage from Genoa to Smyrna. A telegraph cable is landed here from Zea Island.

Port Mandri, immediately northward of Ergasteria Bay, is separated from it by a small hilly peninsula. The so-called port is a bay about ¾ mile wide between the entrance points and more than ½ deep, but a bank with less than 3 fathoms on it extends 400 yards from the western shore. The anchorage is in the central part, in about 10 fathoms, mud and weed, good holding ground. Both Mandri and Ergasteria Bays are protected from the eastward by Makronisi. There is a small village ½ mile from the head of the port, called Thoricus, a station on the railroad from Lavrion to Athens. There are several factories on the shore of the bay.

Vrisaki Point bears from Cave Point 6°, 3¼ miles and forms the northern side of Vrisaki Bay, where vessels occasionally anchor.

Light.—A flashing white light with green sector is exhibited at an elevation of 72 feet, from a square masonry tower, 24 feet high, on Vrisaki Point; it should be visible 14 miles in the white and 10 miles in the green sector. (For sectors of lights see Light List, and chart.

Cape Mavrovuni is 3¼ miles northward from Vrisaki Point and may be said to be the western entrance point of Mandri Channel from the northward.

Jetty.—Between Vrisaki Bay and Cape Mavrovuni, on the western side of Aulaki Bay, at the foot of the mount of that name, is erected an iron jetty belonging to the Sunium mines, French company, for the shipment of manganese ore from their mines at Kamaresa. The height of jetty is 30 feet, length about 90 feet, and depth of water 25 feet, and off it there is good sandy bottom for anchoring.

Mooring appliances have been provided, but steamers loading there should be plentifully supplied with stout wire hawsers. The place is reported to be safe in good weather, but steam should be kept ready, in the event of strong winds from east-northeast to south-

Digitized by Google

east, to run to Port St. Nikolo, in Zea, or to Port Mandri to the southward.

Makronisi (Helene Island) is a long narrow island 7 miles in length in a north-northeast and south-southwest direction and from 1¼ miles to ¾ mile in breadth, hilly and rugged throughout. Its coast line is irregular and cliffy, and its most elevated parts, which are at its northern end, and about one-third from its southern end, are 918 feet and 578 feet high, respectively.

Angarlestro Point—Light—Caution.—An unwatched group, flashing white light, is established on Angarlestro Point. The light is exhibited from an iron beacon on a concrete base, the whole painted white, at a height of 115 feet, and is visible from 207° to 168° (321°), but is obscured northward of 89° by Cape Colona and Gaidoro Island when approaching from the westward.

Caution.—The light shows over Makri Reef and vessels proceeding through the Mandri Channel must be careful to keep within the white sector of Vrasiki Light.

Shoal.—On the western side of Point Angarlestro, the bluff southern point of the island, lying parallel with and 300 yards from the shore, is a rocky shoal about 400 yards in length, with 1 fathom water on it.

Makri Reef, 2.1 miles northward of Point Angarlestro and ½ mile from the western coast of the island, is nearly 400 yards in length north and south, with only 1½ fathoms water on its southern and shoalest part. The whole of Megalo Island open westward of Makronisi bearing 27°, or at night the white sector of Vrisaki Point light, leads westward of the reef.

A large rock close to the western coast, with sunken rocks about 200 yards outside it, lies nearly 1 mile southwestward from Cape Tripiti, the northern end of Makronisi.

Tripiti Rock, awash, and on which except in calm weather the sea generally breaks, lies ½ mile 303° from Cape Tripiti, the northern extremity of Makronisi. The town of Zea open northward of Cape Tripiti leads northward of the rock, and the summit of St. Georgio Island in range with Pegathi Point, bearing 208°, leads westward of it. At nearly 400 yards southward of Tripiti Rock is a shoal with 4 fathoms on it.

At night keeping in the white sector of Vrisaki Point Light leads northwestward of Tripiti Rock.

Cape Tripiti is shoal 200 yards off, and a large rock above water with sunken rocks outside it lies in the small bight on the eastern side about 700 yards from the cape. With the foregoing exceptions, there are no dangers about Makronisi and the water is deep at the distance of ¼ mile.

Digitized by Google

Zea Channel.—The passage between Zea and Makronisi is nearly 8 miles wide, clear of danger, and deep.

Zea (Keos) Island is 10½ miles in length in a northeastern and southwesterly direction and its greatest breadth, nearer the northern end, is 5¾ miles. The island is steep-to all around, no dangers existing more than a ¼ mile offshore. The town of Zea (ancient *Iulis*) stands on a small conical hill on a spur of Mount St. Anna and is approached from Port St. Nikolo by a steep but excellent road winding along the sides of the hills. The population of the island is about 3,800.

Among the few antiquities remaining in the island is a rudely executed colossal lion in bas-relief, 20 feet in length, cut on the face of a kind of slaty rock in a valley between the town of Zea and Mount St. Anna.

Productions.—The island produces cotton, silk, wine, and a considerable quantity of valonia; oaks crown the highest ridge and extend some distance down the valleys on the south. There are also some mines, but they are not at present being worked.

Cape Tamelos—Light.—A fixed and flashing white light is shown, at an elevation of 200 feet, from a cylindrical lighthouse, 25 feet high, situated on Cape Tamelos, the southwestern extremity of Zea; it is visible 16 miles; partly obscured. (See Light List.)

Port Kavia (Kavyas) is a little bay about 3 miles northward of Cape Tamelos, off which vessels may anchor, but in rather deep water, during northeasterly winds. Ekklino Point, northward of the port, should be given a berth of ½ mile, as an isolated flat rock with ½ fathom water on its western part, and on which the sea breaks, lies ¼ mile southwestward of its southern projection.

A small inlet about 1 mile northward of Ekklino Point, named Port Pisa, affords shelter for small coasters with offshore winds. On the hills over the southern side of the inlet are some traces of ancient remains.

Port St. Nikolo (St. Nikolaos).—The only well-sheltered port in Zea Island is that of St. Nikolo, on the northwestern side of the island, about 1,300 yards in length and 500 yards in breadth in the outer part, with from 12 to 19 fathoms water. The entrance is between bold headlands on either side, but that on the north, named Point St. Nikolo, is bordered by a shallow bank which extends off about 40 yards. The best anchorage is in the norther part, in 14 or 15 fathoms, mud, taking care to avoid the telegraph cable from Lavrion, which is landed at the cable house on the northern shore. Merchant vessels calling for coal anchor in the north bay and haul their sterns in to the coaling jetty. With fresh northwesterly winds a heavy swell sets into the southern part of the port, and therefore

Digitized by Google

sailing vessels on the northern side can more readily put to sea when the wind moderates, and it never shifts suddenly from northward to southward.

The customhouse is on the western side of the bay in the southern part of the port, where there is a sandy shore; the head of Port St Nikolo is also composed of a sandy beach, off which a shallow bank extends 150 yards. The port will be known from seaward by Mount St. Savos, a rather elevated hill on the southern side of entrance and above the customhouse just mentioned, the tongue of land forming Point St. Nikolo being rather level and lower, with the lighthouse near its extremity.

Port St. Nikolo is convenient for vessels bound through the Doro Channel when unable to make headway against strong north or northeasterly winds.

Light.—A fixed green light, known as St. Savvas Light, is erected on the southern entrance to the port; elevated 66 feet from an iron column with a sheet-iron hut, on a masonry base, visible 5 miles, partly obscured. (See Light List.)

A fixed red light is shown, at an elevation of 120 feet, from a square white building, 25 feet high, on Point St. Nikolo; it is visible 10 miles; a faint light shows over the port. (See Light List.)

Lloyd's signal station.—A white signal station is situated on the heights about 350 yards to the northeastward of the lighthouse.

Communication.—St. Nikolo is connected by telegraph cable with Ergasteria (Lavrion) Bay, and two steamers call weekly connecting with Syra and Piræus. The telegraph office is at the town of Zea, some two hours' journey from the port.

Port charges are made for vessels calling in to coal, and if required the firm will supply a pilot free of charge.

Trade.—The exports consist of valonia, barley, cattle, wine, vegetables, honey, wax, hides, and almonds; the imports are coffee, cotton and woolen goods, flour, oil, sugar, etc.

Water and provisions can be obtained.

Port Oryas, at the northern end of the island, is a narrow inlet about ½ mile deep with a beach at its head, but exposed to northeasterly winds, and is therefore not used except in cases of necessity. At about ¾ mile eastward of the entrance is the little islet of Spano, 350 yards from the shore, with which it is connected by a rocky bank.

East coast of Zea.—The east coast of the island from Spano Island to Capes Spathi and Tamelos appears to be clear of danger everywhere, a depth of 30 fathoms being nowhere more than 600 yards from the shore.

Port Polais.—On the southeastern coast of Zea, 3 miles from Cape Tamelos, is Port Polais, a small exposed bay, with the swell

Digitized by Google

always setting in on the beach. Here are the remains of an ancient and strongly built town; some inscriptions are still extant and the impression of two colossal feet cut in a large block of marble. It is supposed to be the ancient *Carthæa*.

Current.—There are no off-lying dangers around the whole coast of Zea, but in light northerly winds vessels should not approach its northern end too closely, as the current sets strong toward it.

Port Raphtis.—At 5 miles northward of Cape Mavrovuni, on the mainland, is Raphtis, or Statue Islet, less than 400 yards in diameter and 298 feet high. On the islet, which lies in the entrance to this port, are the remains of a colossal statue of white marble in a sitting posture, which, being much mutilated and disfigured, has been at a distance likened to a tailor sitting cross-legged, and hence the name of both islet and port.

Port Raphtis (ancient *Prasiæ*) is rather over 1 mile wide at the entrance and about 1½ miles deep; northwestward 600 yards from Raphtis Islet is a smaller one called Raphtis Pulo, and westward 1,600 yards from the former is another islet called Praso. These islets, together with a projecting point at the head of the port, and shallow water around its irregular shore considerably contract its area. There is, however, a large available space for anchoring, though exposed from the eastward; the water in places is rather deep and the holding ground is not so good as at Port Mandri. The best anchorage is on either the northern or southern side of the port. The port is easily known by a remarkable bluff on the southern side of entrance, the bold land of Mount Perati, 1,030 feet high, on the northern side, and by Raphtis Islet, which may be passed on either side.

Water may be obtained here, cattle easily procured, and firewood may be had in abundance.

Communication.—The nearest railroad station on the line from Lavrion to Athens is Markopoli, distant about 4 miles.

Marathon Bay.—At about 6 miles northward of Port Raphtis is the low projecting point of Velani, surrounded by a shoal extending off ½ mile, with two little islets on it; on the southern side of the point the shore is low and sandy. At 7¾ miles 12° from Velani Point is Cape Marathon, the termination of a narrow rocky tongue of land projecting 1.3 miles southward and forming the northeastern point of Marathon Bay. From the cape to the point forming the southwestern extremity of the bay the distance is 4 miles, and from the line joining the two the bay is about 2 miles deep, semicircular, and open to the south and southeast. Temporary anchorage in summer may be taken where convenient, the depths on the western side being 7 to 10 fathoms. Cape Marathon should not be rounded too closely, and the southwestern point of the bay is foul and rocky.

Digitized by Google

The shore of the bay is a beach, and at the back of it on the northwest is the plain of Marathon, celebrated for the memorable battle in which Miltiades defeated the Persians, 490 B. C. The mountain torrents which run into the plain during the rainy season form behind the northern shore a deep marsh; the waste water which reaches the sea is unfit for use. On the southwestern side of the plain Mount Mendeli or Pentilicus reaches 3,640 feet above the sea, and from quarries here was obtained the white marble with which the Athenian temples were built. (For continuation of this coast, see p. 129.)

Euripo or Negropont (ancient *Eubœa*).—The Island of Eubœa (pronounced Evvia) is upward of 100 miles in length in a northwesterly and southeasterly direction, with an irregular breadth varying from less than 4 to about 18 miles. It is generally mountainous, the highest elevation being Mount Delphi (ancient *Dirphi*), which, situated in Latitude 38° 37′ North, Longitude 23° 51′ East, rises 5,730 feet above the sea, its summit being scarcely ever free from snow. Mount Pyxaria, northwestward of Mount Delphi, is 4,400 feet high; Mount Okhi, at the southern end of the island, is 4,840 feet high, and on the western coast Mounts Kurumblia and Kandili, of the Kandili Mountains, are respectively 3,994 and 3,072 feet high; farther to the northwest the elevations are from 1,000 to 3,060 feet above the sea. The general formation of these mountains is gray limestone and clay slate.

The plains southeastward are generally cultivated with corn and olives, but the plains of Oreos northwestward are more particularly appropriated to the vine, from which a light red wine is made, the common beverage of the Greeks and a staple article of trade. The principal towns are Euripo, situated in the narrowest part of the strait of that name; Xero Khori, near the northwestern extremity, Kumi, near the cape of that name on the northeast coast; and Karystos, at the head of the bay of the same name, at the southern end of the island. The villages are few and generally on elevations at some distance from the beach. The population of the island is about 103,300.

Eubœa Island is separated from the main by a very narrow strait, anciently called the *Euripus*, and spanned by a bridge. To the northward of the bridge the space is called Talanta Channel and that to the southward Euripo Channel, but the wider space between the southern end of Eubœa and the mainland is named the Gulf of Petali.

Karystos Bay, at the southern end of Eubœa, is 3¼ miles wide at the entrance, deep, and clear of danger except on the western shore, where it is rocky and foul; it is exposed to all southerly winds. Vessels unable to proceed through the Doro Channel against strong northeasterly winds can not do better than anchor in this bay, but

Digitized by Google

in entering under sail be prepared for the heavy variable squalls which blow from the highland; in anchoring veer a good scope of cable and have a second anchor ready to let go, as the holding ground, sand, or sand and shell, is indifferent.

A good berth is in 16 fathoms, with Paximadion Islet (44 feet high) just open of the inner western point of the bay, and for small vessels a little farther in. A sailing vessel should not, however, go too far in, as the winds may be light and baffling when leaving and there is frequently an indraft into the bay. The old village, 1½ miles inland, is in a ruined state and half deserted, but a new village has sprung up near the shore at the head of the bay. The population is about 1,500.

The breakwater, which is about 440 yards in length, leaves the shore just westward of the ancient castle. Small vessels loading or unloading lie with their sterns secured to the wharf on the northern side of the harbor, where there are also landing steps, at which there is a depth of 7 feet. The eastern part of the harbor is shallow and dries in places. In the center of the harbor there are depths of from 12 to 15 feet over a mud bottom, and of from 4 to 7 feet alongside the wharf mentioned above.

Landmarks.—A white chapel, which is conspicuous, stands on the islet situated on the western shore of the bay, and in the town is a white church which forms a good mark.

At some distance up the hills eastward of the ruins of the castle are some ancient quarries, in which a few years ago there remained several columns, some nearly finished and others still adhering to the marble rock by a small part only. These columns were of extraordinary dimensions, one measuring 65 feet in length by 4½ feet in diameter. The side of the hill downward is strewn with fragments in all directions, and there appears to have been an inclined plane or road by which they were transported to the sea; their magnitude must have rendered this operation a most difficult one. The view from these quarries is magnificent and amply repays the labor of ascending to them.

Light.—A light is exhibited from the northern side of the entrance to the harbor.

Supplies.—Fresh meat and provisions may be obtained at the town of Karystos, and game abounds during the season, especially woodcock. Water is scarce.

Communication is maintained once a week by steamer with Ergasteria Bay. The town of Karystos is also a telegraph station.

Winds.—At the commencement of a gale from the northward the wind under the land at Karystos is light and variable, but as it gains strength it blows down from the hills in heavy variable squalls and at time for a few minutes appears to make the anchorage a lee shore, but there need be no apprehension, as the wind does not suddenly

Digitized by Google

veer from north to south, but gives sufficient warning. (For east coast of Eubœa, see p. 136.)

Petali Islands.—These islands and islets lie off the southwestern coast of Eubœa, northwestward of Karystos Bay; the group consists of two islands (Megalo and Xero) on the south and six islets on the north, the whole occupying a space of about 4¾ miles north and south and 2½ miles east and west.

Megalo Island, the southwestern of the group, is more than 2½ miles in diameter and 1,285 feet high. Xero, 1.7 miles in length north and south and 610 feet high, lies only 300 yards northeastward of Megalo, to which it is connected by a ridge with 1 fathom of water on it, apparently the remains of a mole.

Trago Islet lies to the northwestward and in the middle of the entrance to the bight between Xero and Megalo; from it a shoal, with less than 3 fathoms, extends 300 yards to the southward. Midway between Trago Islet and Megalo there is snug anchorage for small vessels in 7 fathoms, sandy bottom.

Phundo and Praso Islets, northwestward of Trago, are 400 yards from each other, and between them and Trago there is anchorage in from 9 to 12 fathoms, sand and gravel.

Light.—On the southern extremity of Phundo Islet, a flashing red light is shown, at an elevation of 16 feet, from a white iron tower, visible 7 miles. (See Light List.)

Lamberusa, 900 yards northwestward of the northern end of Xero, is the largest of the six islets; a shoal extends nearly 200 yards southeastward from its southern point, between which shoal and Xero the passage is deep and clear.

Shoals.—The two little islets of Makro and Avgo are the northwestern of the group, and 750 yards 304° from the northwestern extremity of Makro Islet is a shoal with a depth of 3½ fathoms on it. From the center of Abgo Islet 300 yards 310° is another patch with 3 fathoms water on it; the water is deep outside them. From the clearness of the water around these islands the dangers will probably be seen, but their vicinity should be given a wide berth.

Supplies.—No fresh water is to be obtained at the Petali Islands, and what is necessary for the few inhabitants has to be brought from Marmari Bay, to the northeastward. A few olives, grapes, and a small quantity of corn are grown. Rabbits, quails, and partridges are found. The islands are resorted to by sponge divers and fishermen, and occasionally coasters anchor for shelter.

The currents run strongly between the islands and are much influenced by the prevailing winds.

Directions.—In running for shelter under the lee of the Petali Islands from southerly gales, which prevail in the winter months, there is no danger in coasting the western side of Megalo Island, and when the peak of Trago Islet is open of the northern point of Megalo

Digitized by Google

a vessel may haul in for the anchorage between Phundo and Praso, on the one side, and Megalo and Tragoon, on the other, anchoring in mid-channel, in 9 to 12 fathoms, between the western extremity of Trago and Praso Islet.

Vessels wanting to refit may enter the inner anchorage, between Trago and Megalo, and anchor in 7 fathoms, sand, good holding ground, with a smooth sea in all winds. For sailing vessels bound to the southward the outer anchorage is preferred, as the wind shifts suddenly from south to north, and it can be left with facility.

Sailing vessels bound through the Doro Channel, and having to bear up from strong northeasterly gales, will not generally be able to reach these anchorages, for the gales come on suddenly and blow with such violence from the mountains northward of Karystos that it is almost impossible to carry sufficient sail to beat up.

Xero Pass.—Xero Island is separated from the coast of Eubœa by a passage called Xero Pass, with a depth of 6 fathoms and 300 yards wide between the 5-fathom curves. At the northern part of the pass shallow water extends from the coast of Eubœa nearly halfway across, but by keeping on the Xero side 6 fathoms water can be carried through.

Four-feet Rock.—Northwestward from Paximadion Islet, the western entrance point of Karystos Bay, is a point called Cape Roxo, 1,650 yards 294° from which is a rock having only 4 feet water on its southeastern part and called Four-feet Rock. The shoal under the depth of 3 fathoms is 150 yards long southeast and northwest.

Phundo Peak, in range 313° with the northeastern extremity of Megalo Island, leads southwestward of the shoal.

Shoal.—At 1,400 yards, about 256° from Four-feet Rock, is another shoal with 2½ fathoms on it, lying in line between Cape Roxo and Avlabo Point of Megalo, distant from the former 1½ miles. Marmari Point, the northern entrance point of Marmari Bay, in range with the eastern extremity of Xero Island, bearing 346°, leads close westward of the shoal; the point should therefore be shut in with the eastern extremity of Xero. Marmari Point ,bearing 341°, just in range with the extremity of Eubœa, or slightly open, leads between the above dangers.

Cape Roxo is difficult to distinguish, not being in sufficient relief from the highland at the back; at 200 yards southwestward of it is a shoal with 5 feet water on it. Vessels with a southerly wind intending to run through Xero Pass will avoid the above dangers by keeping about 1 mile from Megalo, and by borrowing on the Xero shore in the pass may enter Marmari Bay without difficulty, where there is anchorage off the houses in from 17 to 12 fathoms, mud, but it is seldom resorted to.

Akio Islet and Dipsa Rock.—At 5½ miles northwestward of Megalo Island and 2 miles westward of the southern extremity of the

Digitized by Google

point surmounted by Mount Viglia (southeastward of which is Elapha Islet) is the small low islet of Akio; and 2¼ miles farther northwestward is another but smaller islet or rock named Dipsa, which lies 2¾ miles 99° nearly from Cape Marathon. There are no dangers in the neighborhood of these islets.

Light.—From a white iron tower on the summit of Dipsa Rock is exhibited, at an elevation of 56 feet, an unwatched flashing white light, visible 9 miles. (See Light List.)

Stura Island.—This island, at the northern end of the Gulf of Petali, is triangular in shape, with its northern side 1¼ miles in length east and west, thence tapering southward upward of 1½ miles. Its coast line is irregular, bordered here and there by shallow patches, and having several small islets and rocks in its vicinity, the shoals around which are steep-to. The group forms with the coast of Eubœa the sheltered bay of Stura, but the water in it is too deep for anchoring.

Telegraph.—The village of Stura, situated about 1½ miles from the shore of Stura Bay, is a telegraph station.

Shoal.—Between Phonias, the northwestern islet of the Stura group, and a point projecting from the coast of Eubœa on the north is a 2-fathom shoal. Cape Strongylo, southward of Stura Island, open of Petusi Islet, at the southern end of Stura, bearing 147°, leads westward of the shoal.

Berdugi Islets.—Cape Hagia Marina, on the main shore, 4½ miles northward of Cape Marathon, is a bluff 713 feet high. Southeastward of it and separated from it by a passage ¾ mile wide are the four small islets of Berdugi, and the least depth between them and the cape is 6 fathoms.

To the eastward of the Berdugi Islets are the Stura group and shoals previously described, the passage between these two groups being deep and clear; the 2-fathom shoal, northwestward of the latter group and the nearest hidden danger to the Berdugi Islets, bearing from the lighthouse 51°, 1¾ miles.

Vessels may pass on either side of Berdugi Islets by giving them and the points of the coast a reasonable berth.

Current.—The currents at times are strong.

Light.—On the largest and highest of the Berdugi Islets, at an elevation of 234 feet above the sea, a fixed red light is exhibited, visible 16 miles. (See Light List.)

Cavaliani Island, at the entrance of Port Armyro Potamo, is 1½ miles in length north and south, with an average breadth of ½ mile, and 568 feet high. Shallow water surrounds all its projecting points, which at the northern end extend off more than ¼ mile.

The passage dividing Petali Gulf from Euripo Channel between Cavaliani Island and Cape Hagia Marina on the southwest, is 1¼ miles wide, deep and clear.

Digitized by Google

Land mark.—A conspicuous ruin stands on the summit of the hill at the southern end of the Cavaliani Island.

Port Armyro Potamo, or Salt River (from a small pool or salt spring below the level of the sea at its head), runs in about 3 miles northeastward from Cavaliani, with deep water, but it is seldom visited even by boats. The principal entrance is northward of Cavaliani Island, as the southern end is only separated from the coast of Eubœa by a narrow deep passage with shoals on either side.

Euripo (Evripos) Channel.—Having passed between Cape Hagia Marina and Cavaliani Island, the Euripo Channel opens out and continues northwest by north and then west-northwestward for about 25 miles as far as Burj.

Limiona Bay, on the mainland, is situated about 3¼ miles northwestward from Cape Hagia Marina. A jetty 200 feet long, with a depth of 22 feet water at its outer end, is situated on the western side of the bay, for the convenience of vessels loading hematite iron ore, brought down from the mines at Grammatice, in the Marathon District, by a narrow-gauge railroad some 9 miles in length. A screw mooring buoy is laid down, and it was intended to arrange for the shipping of 1,000 tons of ore daily.

Vessels bound for this bay have to stop at Ergasteria Bay (Lavrion) for clearance.

Aliveri Bay.—At Aliveri Bay, in the northeastern part of the channel, there is anchorage in 15 or 16 fathoms, rather close in, but the holding ground is good.

Light.—A fixed red light is shown at the end of the pier. The light is exhibited 29 feet above the sea from an iron column, with a sheet-iron hut, on a masonry base. Visible 6 miles. (See Light List.)

Communication.—Steamers running between the Piræus and Volo stop occasionally at Aliveri, which is a telegraph station.

Water.—No fresh water can be obtained.

Apostolos Bay, on the mainland southwestward of Aliveri, possesses salt springs similar to those at Port Armyro Potamo, with water mills and storehouses. At 5 miles west-northwestward of Apostolos Bay is Oropos Bay, where there is anchorage and landing and on its eastern point a windmill.

Oropos Bay—Light.—An unwatched flashing white light is exhibited from a white beacon tower standing on the point on the eastern side of Oropos Bay, 55 yards from the shore.

The light is exhibited from a white iron tower on a masonry base and is visible 9½ miles.

Port Eretria.—The little Port Eretria and village of Eretri, with an isolated hill 427 feet high, on which is the site of the ancient Acropolis, is on the northern side of Euripo Channel, nearly opposite Oropos Bay.

Digitized by Google

Light.—A fixed red light is shown, at an elevation of 24 feet, from a masonry structure, 19 feet high, erected on a rock near the end of the old mole on the western side of the entrance to Port Eretria; it should be visible 6 miles. (See Light List.)

Landmarks.—The Venetian fortress and the two Venetian towers at Philla are conspicuous.

Shoals.—The islets of Vathya to the eastward of the port, are surrounded by numerous rocks and shallow patches, the latter extending about 2 miles eastward of the port, and 1½ miles westward, the whole ranging 1 or 1½ miles from the shore. A rocky patch with 2 fathoms on it, lies 1 mile 248° from the lighthouse and a 5-fathom patch ¼ mile farther in the same direction. Patches with 1½ to 3 fathoms on them also lie ½ mile southward of the entrance to the port. These dangers should not be approached, as there are no marks for avoiding them; they are steep-to, and generally visible in the day time. Vessels should keep rather on the southern side of Euripo Channel.

Northeastward of these dangers, there is sufficient anchorage space for small vessels in case of necessity, and it can be approached from the eastward by keeping along the Eubœa shore.

Telegraph.—The village of Eretri is a telegraph station.

Burj Point.—The round rocky mass surmounted by a ruin called the Burj, on the eastern point of entrance to the outer port of Euripo, is a good mark from the southeastward; from Oropos Bay the distance is about 8½ miles, and the channel clear. Vessels may anchor ½ mile southeastward of the Burj, with the light bearing 310°, in 6 to 8 fathoms, sand and mud.

Light.—A fixed red light is shown, at an elevation of 29 feet, from a stone building, 27 feet high, near the extremity of the low point opposite Burj.

Winds.—In entering the Burj and Steno Channels it is necessary in a sailing vessel to have a fair or leading breeze or to have recourse to warping. Vessels running up from the southeastward in summer with the sea breeze should be prepared to anchor at any moment, for it frequently happens that the wind does not blow home to the head of Euripo Channel, but often on rounding the Burj the wind will be found blowing from the northward, having been diverted by the high range of Mount Delphi, and blowing fresh down from that mountain, it meets the sea breeze up the Euripo Channel.

Burj Channel.—This channel, marked by the Burj on the eastern side and the lighthouse just alluded to on the western side, leads from Euripo Channel to Euripo outer port. It has been dredged to a depth of 26 feet, but the depths in the outer port in places diminish to 21 feet, so that only vessels drawing less than 19½ feet can pass through without the assistance of buoys.

Digitized by Google

Tidal streams.—The tide in the Burj Channel rarely exceeds 2 miles an hour.

Burj Spit.—Depths under 1 fathom extend from the Burj 200 yards southwestward and depths under 3 fathoms extend 350 yards 231°. Abreast of this spit depths under 3 fathoms extend 150 yards from the low sandy mainland shore, narrowing the channel with more than the latter depth to 330 yards.

The bank off the mouth of the stream situated about 600 yards southeastward from Burj Point is reported to have extended about 300 yards to the southwestward.

Light.—At Avlide, opposite Burj Spit, an occulting white light is exhibited from a square tower above a dwelling at an elevation of 30 feet, visible 10 miles. (See Light List.)

Lightbuoy.—A can-shaped lightbuoy with superstructure showing a flashing white light every three seconds is moored in a depth of 3 fathoms off the end of Burj Spit.

Directions for Burj Channel.—No direct range marks can be given for this narrow and tortuous channel and the eye must be the principal guide, but the following observations are given with the view of assisting the navigator: Approaching from the southward, keep the left extremity of Pasha Adasi (an islet visible over the low western point of Burj Channel) in range with the right extremity of Fort Kara Baba (opposite the town of Euripo or Khalkis) until the four houses, which are easily seen on Burj Point, are in range with each other; then with the helm aport round Burj Spit slowly and carefully until the vessel's head is pointed northward, keeping nearly in mid-channel or rather nearer the western shore.

From the northward after passing the white tower keep it in range with Perama Point, bearing 315°, until Burj Light bears 175°, whence steer to pass the lighthouse point at a distance of 200 yards; thence the white tower in range with the right extremity of Fort Kara Baba, bearing 330°, will lead clear of the spit.

Should the buoy marking the end of the Burj Spit be in place, it will be a good guide in either case.

A good mark for passing the Burj Spit is the lighthouse in range with the highest hill near the town of Euripo or Khalkis until near the lighthouse. Then round it at the distance of 200 yards.

The yellowish hue of the shallow ground extending southwestward from Burj Point will probably be seen in contrast to the deeper greenish water. After passing the lighthouse point at the distance of 200 yards, keep well to the northward before steering toward the white tower on Beacon Rock.

Euripo outer port.—The Burj Channel leads into the outer of the two ports of Euripo, which extends 3 miles north-northwestward; both shores are bordered by banks, but throughout the central part there is anchorage, if necessary, in from 20 to 30 feet, soft mud; a

Digitized by Google

convenient stopping place is northward of Pasha Adasi, in 20 to 23 feet. Around the shores of the outer port are several bays.

Krianaru Rock.—This rock or islet is situated 1.2 miles 307° from Burj Channel Lighthouse and marks the southwestern side of the channel. A depth of 3 fathoms will be found 100 yards outside of this rock.

Kolova (Beacon) Rock.—This isolated rock is itself 2 feet above the water. It bears 23°, 800 yards from Krianaru Rock, and has a depth of 28 to 30 feet water around it and between it and the shallow bank 250 yards northeastward of it. When in its vicinity Fort Kara Baba open westward of the mill on the peninsula southward of Euripo Strait leads westward of the rock.

Light.—An unwatched flashing light showing red and green sectors and partly obscured is erected on Kolova (Beacon) Rock.

The light is exhibited 25 feet above the sea from a tower consisting of a marble column, slightly conical, on a square base, surrounded by a circular staircase terminating above in a balcony, above which is the lantern. The column is white and the ironwork red. The red light is visible 6½ and the green light 5½ miles. (See Light List.)

From the shore 150 yards westward of the bridge a spit extends southward the latter distance, where there is a depth of 18 feet.

Pasha Adasi.—At the northern end of the outer port, 800 yards eastward of the entrance to Steno Pass, which leads to the inner port, is Pasha Adasi, an islet about 250 yards in diameter, the peak of which, 60 feet high, will be seen southward of Burj Channel over the lighthouse point.

Water.—On the northeastern shore, near the head of the outer port, a plentiful supply of water, which runs from the rocks, may be obtained, though it is not always good for drinking, being impregnated with vegetable matter previous to entering the sea.

Steno pass.—This pass, leading from the outer to the inner port of Euripo, has been dredged to a depth of 19½ feet, and is to be dredged to 21 feet. It is ½ mile long, and in the narrowest place, only 114 feet in width.

Lights.—A fixed red light is shown, at an elevation of 34 feet above the sea, from Perama Point, on the southern side of the eastern entrance to Steno Pass, visible, 6 miles. (See Light List.)

Steno Pass is marked by two fixed white lights visible 2 miles, exhibited from skeleton iron towers located 950 yards 306° and 1,000 yards 290°, respectively, from Perama Lighthouse.

Directions for Steno Pass.—After passing the tower on Kolova Rock, steer with Pasha Adasi a little on the starboard bow and approach the pass keeping rather nearer the southern entrance point, and then keep in mid-channel, being guided by the chart and the above two fixed lights.

Digitized by Google

Tidal streams.—The stream at times runs through Steno Pass at 2 knots an hour.

Inner port.—The inner port of Euripo is supposed to be the port Aulis, where the Grecian fleet assembled previous to the Trojan War. It is a natural circular basin 1,400 yards in diameter outside the 5-fathom curve, with an even mud bottom, and from 5 to 6 fathoms deep. Around the shores of the basin are two or three beautiful coves and at the northeastern part the strait and town.

Shoals.—Vurkos Bay, one of the coves just mentioned, is on the eastern side of the inner port. It is very shallow and not more than 3 fathoms will be found 100 yards westward of the line of its entrance points. From the shore of the cove in the southwestern corner of the inner port a shallow flat makes off 350 yards.

A patch, with 1½ fathoms on it, lies 300 yards from the north shore, bearing 259°, 900 yards from the bridge.

Anchorage.—The best anchorage is in the middle of the inner port.

Euripo (Khalkis).—The principal town of Eubœa, with a population in 1914 of about 10,500, is at that part of the island where it is separated from the mainland by the narrow strait called by the same name. It was formerly a walled town, but the walls have almost disappeared. A ruined tower at the southern end of the wall is still conspicuous. The walls were turreted, slight, and built without regularity, and there appears to be no doubt of their Venetian origin. The area formerly inclosed was about 800 yards north and south by about 500 yards in breadth; the streets are narrow, but the houses are capacious.

Fort Kara Baba, on the main, which stands on an eminence about 130 feet high, commencing its rise immediately from the bridge. The fort overlooks and commands the town, but it is a misshapen structure of an oblong form, about 280 yards long and 100 broad; the walls are in places so low that an active man might vault over them, and they are similar to and coeval with the walls of the town.

Outside the town, to the northeastward, is a suburb appropriated to trade. The houses here are small, the shops contain general stores, articles of dress, or are coffee houses, but there is little or no trade.

Supplies.—The market is well supplied, especially with fish; beef is difficult to be procured, but mutton is plentiful. Water is scarce, and obtained chiefly from wells.

Communication.—Euripo is connected by railroad with Athens. Greek steamers from Athens and Volo call frequently. Telegrams can be sent to all parts of the civilized world.

Bridge.—This is a swing bridge in two parts opening northward and fitting into masonry arranged for that purpose. The bridge is

Digitized by Google

opened by day in response to a steamer's whistle, when the current is not too strong.

A white ball hoisted on a staff denotes the bridge is open to a vessel coming from the south, and a red ball for a vessel coming from the north.

The Euripo-Athens Railroad section being now opened to traffic, it may happen that a vessel must wait a long time for the opening of the bridge. As the current in the strait may attain 7 and in stormy weather 8½ miles, it is advisable to anchor before entering the narrow channel, and not approach the passage till after the opening of the bridge. Sailing vessels and the larger steamers should only attempt the passage at slack water.

Euripo Strait at the bridge is 129 feet wide and is intended to be 28½ feet deep, but in 1905 it was reported that there were only 21 feet. The walls of the town are being gradually demolished and the moat filled in. The old bridge towers have been destroyed.

Tonnage dues.—The following are the dues imposed upon merchant vessels passing through Euripo Strait, naval vessels of all nations being exempted:

a. Vessels from 3 to 20 tons, 50 lepta per ton.

b. Vessels of more than 20 and up to 50 tons, 40 lepta per ton.

c. Vessels of more than 50 and up to 100 tons, 30 lepta per ton.

d. Vessels of more than 100 and up to 300 tons, 20 lepta per ton.

e. Vessels of more than 300 tons, 15 lepta per ton.

One drachma = 100 lepta = about 9½d.

Tides.—It is high water, full and change, at Euripo Bridge at 5 h. 15 m.; springs rise about 2 feet; neaps are irregular.

On the northern side of the bridge the mean spring rise is about 2¼ feet, but in the months of July, August, February, and March the rise is 3 feet. On the southern side of the bridge the spring rise is seldom as much as 2 feet. The neap range is irregular and at times only a few inches. With southerly and southwesterly gales a sudden rise of 6 feet has been experienced.

Tidal streams.—At full and change the stream commences to run to the northward at about 8 h. 15 m. a. m., or nearly at half ebb, and to the southward at 2 h. 20 m. p. m.; except for a few days at neaps, both streams set about 6 hours each way, attaining at springs a velocity of 6 or 7 knots an hour, which gradually decreases to neaps. During neaps the stream is irregular and its strength from ½ to 1 knot an hour, but at times during this period there is but little tidal movement.

Both streams are regular in the changes from new moon to the first quarter (or within a day or two of its occurrence), then irregular for 2 or 3 days; again regular to full moon and until the last quarter, and again irregular for 2 or 3 days, and then again resume a regular course. During the regular period the change of the stream is about

Digitized by Google

40 minutes later each day, but much influenced by the winds; slack water occurs at half tide by the shore and usually only lasts for about 10 minutes. When the stream has run for about 3 hours from the north to the south of the bridge, it will be high water on the north and low water in the basin on the south, and vice versa with the other tide.

With southerly and southwesterly gales the velocity of the tidal stream from south to north is increased to 8 or 8½ miles an hour for the first day of the gale, followed, probably on the second day, by a rush of equal strength to the southward.

The tidal stream in Steno Pass and Burj Channel seldom exceeds 2 miles an hour.

Directions for Euripo Strait.—With proper care and commanding speed, steamers, excepting the largest, may pass through without difficulty in any condition of weather or current.

It will be necessary for a sailing vessel at anchor to be under way before slack water, which can not be calculated at times to 15 or 30 minutes, and be prepared to pass the bridge immediately the flag is shown as a signal that it is open. This flag is shown from a staff close to the bridge on the town side. At present there are no tugs in the vicinity.

The strait northward of the bridge is bordered on either side by shoal water, which leaves in the central part a narrow but clear passage. At the point of the quarantine establishment (in ruins) on the main, 800 yards from the bridge, rocky shallow ground extends off 100 yards, and also the same distance from Tekies Point on the opposite side of the strait; the extremities of these shoals are marked by lightbuoys, the passage between these shoals is about 120 yards wide, and when the buoys are in position there will be no difficulty in keeping in mid-channel.

Lightbuoys.—A cylindrical red buoy, showing a flashing red light every three seconds, visible 6 miles, is moored in 20 feet of water at the western extremity of the shoals making off from Tekies Point.

A cylindrical green buoy, showing a flashing green light every three seconds, visible 5 miles, moored in 18 feet of water at the eastern extremity of the shoal making off from Quarantine Point.

Directions.—Vessels should always pass between the two lightbuoys, which are moored 135 yards apart, but never between one of them and the shore. These buoys, and especially the one off Point Tekies, are moored in a strong current and should one be carried away navigation should pass close to the one remaining, leaving it to the eastward if the light shows red and to the westward if it shows green.

Telegraph cable.—A cable crosses the strait between these shoals.

Digitized by Google

Lights.—At about 100 yards from the end of the point on the western side of the strait about 400 yards northward of the quarantine establishment is a frame lighthouse, from which a fixed white light is exhibited at an elevation of about 39 feet above the sea, visible 7 miles. (See Light List.)

On the western side, at 40 yards within Kaki Kephali Point, from a lighthouse 40 feet high, a fixed red light is exhibited, elevated 68 feet above the sea, visible 14 miles in clear weather; partly obscured. (See Light List.)

Rocks.—A patch of shoal ground with less than 1 fathom on it lies with its shallowest spot bearing 65°, 332 yards from Kaki Kephali Lighthouse; shoal water under the depth of 4 fathoms extends 300 yards farther eastward. A shoal with 4½ fathoms water over it lies 1,600 yards 23° from Kaki Kephali Lighthouse. Other points of the coast of Eubœa farther northward and forming the anchorage are foul ½ mile off.

North roadstead of Euripo.—The space from Kaki Kephali Lighthouse northward to the parallel of Cape Gaidaro, being the southeastern part of the Talanta Channel, may be considered the northern roadstead of Euripo, as, with the exception of the shoals just alluded to, there are anchoring depths all over it, in from 17 to 10 fathoms, mud bottom, sheltered from the westerly winds by Cape Gaidaro and the shoal which extends nearly 1,400 yards northward from it; in the winter season it would be advisable to anchor within about 1 mile of the town of Euripo.

(The north roadstead of Euripo, with lights, is repeated at page 141, where the Talanta Channel is described.)

Doro Channel (kaphireus), between Eubœa and Andros Islands, is 6 miles wide; the wooded sides of Eubœa present an agreeable aspect, in contrast with the dry rocky appearance of Andros Island. The northwestern side of the channel is bounded by the base of Mount Okhi, which forms generally a steep rugged coast with a small bay or cove here and there, the only off-lying danger being a rock, which shows well at low water and is awash at high water, lying a long 200 yards northeastward of Kastri Point, the northeastern entrance point to the bay of that name; within it are some shallow patches.

Mount Okhi, about 7 miles north of Cape Mandili (the southeastern extremity of Eubœa), rises 4,840 feet high; it has three distinct peaks, and its sides a short distance down on the north and south are clothed with groves of splendid chestnut trees.

Mandili (Myrto) Islet.—At the foot of Cape Mandili is the islet of the same name, 286 feet high, nearly 1 mile in length and separated from the cape by a deep passage about 700 yards wide. (For southwest coast of Eubœa, see p. 124.)

Digitized by Google

Intended light.—A fixed and flashing white light, visible 20 and 31 miles, respectively, will be established on Mandili Islet.

Cape Doro.—The coast of Eubœa from Mandili Islet trends northeastward and northward for 13½ miles to Cape Doro, a high bold prominent headland and the northwestern entrance point of Doro Channel from the northeastward. The little islet of Doro, 93 feet high, lies about 700 yards to the eastward face of the cape. (For northeast and north coasts of Eubœa and mainland to the northward, see p. —.)

The southeastern side of Doro Channel is bounded by the northwest coast of Andros Island, which is steep and rugged, with no off-lying dangers. Sailing vessels should not approach this part of the island too near in light winds, on account of the current. Andros Island is frequently obscured during autumn and winter, both with southwest and northeast winds.

Light.—At Cape Phassa, the northwestern point of Andros Island and about ½ mile inland, is a stone lighthouse, 70 feet high, from which a fixed white light is exhibited at an elevation of 708 feet above the sea. The light is visible seaward 30 miles. (See Light List.)

Andros Island, northwest coast.—From Cape Phassa this coast trends with a slight curve east-northeast 5 miles to Cape Kabanos, the southeastern entrance point of Doro Channel from the northeastward.

Between Cape Phassa and Goremi Point, nearly 6 miles to the southward, the coast of Andros Island is irregular, cliffy, with a few sandy bays, and has deep water all along. On Pyrgo Point, 1½ miles to the eastward of Cape Phassa, is a conspicuous ruined tower. Cape Nikolo, 2½ miles from Cape Phassa, is the termination of a tongue of land projecting a little more than ½ mile from the coast, and in approaching from the northward appears like an island till within 10 miles of it, when the intervening land becomes visible. At ¾ mile eastward of Goremi Point is Kastri Head, a cliffy bluff about 200 feet high, forming the western entrance point of Port Gavrion.

Winds.—The navigation of Doro Channel is one of the difficulties of the Levant, especially in sailing vessels, as the strong northerly winds which prevail during the summer months may be said scarcely to cease for upward of four months of the year, viz, from the beginning of May until the end of August or middle of September; and after the autumnal equinox, although they do not so constantly prevail, gales from that quarter are as heavy and frequent as from other points of the compass.

It is to be observed that these strong winds through the Doro Channel, which form such an impediment to vessels bound to the eastward, are often during summer strictly local, and do not interfere

Digitized by Google

with the sea breezes which blow freshly into the gulfs and bays during the day nor with the land winds which draw off the mountains at night. In this season it is common for vessels to pass Cape Colonna in the forenoon with a fresh breeze from the Gulf of Athens and carry it nearly as far as the northern end of Zea, where they meet a strong breeze blowing through the Doro Channel.

In these cases it is not advisable to attempt to pass northward of Zea, for although there may be every appearance of being able to weather the island, there is danger in too close an approach, for it is almost certain that near the northern point the wind will fail, with a heavy surf beating on the rocky shore, a strong current setting toward it, and the water too deep for anchoring.

Current.—The general current from the Dardanelles, which sets toward the western part of the archipelago, is much accelerated by the strong northerly or northeasterly winds and causes the stream in the Doro Channel to run with great strength. In December 1905, during a strong northerly wind, the British naval vessel *Sentinel* experienced a southerly set of 7 knots. In working through the Doro with a moderate breeze from the northeast a weatherly current for some miles has been found on the coast of Eubœa.

Kaloyeri Rocks or the Monks.—These consist of two detached rocks, one large, the other small, lying in the fairway between the Doro Channel and ports to the eastward. The great Kaloyeros is a barren volcanic heap about 120 feet high, with a chain of rocks extending southeastward, free from all known hidden dangers, and bears about 68°, 25½ miles from Cape Kabanos, the northern point of Andros Island. The Great Kaloyeros at a distance of 8 or 9 miles to the northwestward has been taken for a sail. It makes in the form of a sugar loaf, except when viewed from the southwest, when it appears split in two.

The Little Kaloyeros is only about 4 feet above the water and about the size of a small boat, with a reef extending about 100 yards to the southward, on which the sea breaks; it lies ¾ mile northeastward of the Great Kaloyeros.

Andros Island—Gavrion Bay.—Vessels unable to work through the Doro Channel, and having to seek shelter during strong northerly gales so prevalent during the summer months, especially from May to September, instead of beating about in these gales under the lee of Andros or bearing up for Port St. Nikolo of Zea, Ports Raphti, Mandri, or Legrana Bay near Cape Colonna, are recommended to take shelter either in Karystos Bay in Eubœa or in Gavrion Bay on the southwestern side of Andros, and thereby save much time and anxiety.

Gavrion Bay affords ample and excellent anchorage anywhere eastward of the port between the islands fronting it and Phurnos Bay.

Digitized by Google

The depth of water immediately eastward of the port is 7 to 9 fathoms, gravel, sand, and weeds; but the best anchorage is in from 17 to 20 fathoms between Megalo Islet and Phurnos Bay. The bay is open to the southward, and vessels finding it inconvenient can put to sea or enter Port Gavrion, where the wind from this quarter never blows home.

Light.—A fixed red light, elevated 225 feet above the sea, is shown from a stone lighthouse, 26 feet high, on Kastri Head, the western entrance point of Port Gavrion; it should be visible 7 miles. (See Light List.)

Gavrion Islets are a group of seven islets and rocks, of which Megalo, the largest, is more than 1,200 yards in length north and south, narrow, with a hill 190 feet high at its southern end; the other islets extend northwestward and westward from it about 1,400 yards. The east and west sides of the group are clear of danger, but shallow water extends north and south from the islets, except the southern end of Megalo; Turleta, the southwestern islet, is also clear. From Plati, the northwestern of the group, shallow water extends 300 yards to the north-northeastward, narrowing the passage between it and Vovi Shoal 750 yards.

Vovi Shoal.—This shoal, in the approach to the anchorage, lies between Plati and Akra Point, the eastern point of Port Gavrion, having a channel 600 yards wide and 6 to 9 fathoms deep between it and the latter point. It is 400 yards in length northeast and southwest, 150 yards in breadth, and has only 2 feet water on its shoalest part near the southern end, which is named Vovi Rock. In the center of the shoal is a patch with 1 fathom and near the northern one end with 1½ fathoms water on it; in other places the depths vary from 2 to 4 fathoms. This danger is much in the way of vessels passing between the islets and Port Gavrion to the anchorage off Phurnos Bay.

Directions.—The summit of Jura Island 181° open westward of the summit of Gaidaro (120 feet high), the western islet of the Gavrion group, leads westward of Vovi Shoal; Turleta, the small sugar-loaf islet and southwestern of the group, bearing 186° open of the extremity of Gaidaro, also leads westward of the shoal.

The monastery on the hill eastward of Phurnos Bay, bearing 68° open its own breadth of Koruni Head, leads between Vovi Shoal and the shoal extending northward from Plati Islet; or, a vessel may enter Phurnos Bay, northward of Vovi Shoal, by passing Black Rock (off the eastern side of entrance to Port Gavrion) at the distance of 200 yards.

Port Gavrion is about 1,400 yards deep, 500 yards wide in the entrance, and carries from 13 fathoms water at the entrance to 3 fathoms 200 yards from its head, over a bottom of sand, mud, and

Digitized by Google

weeds; the port is open southward and terminates at its head in a tranquil sandy beach, fully indicating its safety, as southerly winds never blow home and any great sea or swell is broken by the islets fronting it.

To a small vessel seeking shelter in a southerly gale, after having passed through the Doro Channel, it is conveniently situated, but it is difficult of access in a sailing vessel during strong northerly winds, owing to the heavy gusts from the highland, and also from the baffling winds which prevail when the wind is moderate from that quarter.

From Akra Point (the eastern point of the port) eastward are several small shingle beaches interrupted by rocky projecting points, off which are rocks above water, besides patches of foul ground nearly 400 yards from the shore; then follows a sandy bay named Petros, which is separated from Phurnos Bay by the small peninsula forming Koruni Head, distant a little less than 1 mile from the nearest Gavrion Islet, and between which vessels may anchor.

Supplies, water.—Supplies can be obtained in small quantities at Port Gavrion and water by sinking a well in the plain near the shore. In Leukos Bay, rather more than 1 mile southeastward of Phurnos Bay, from a spring which trickles down a ravine, a plentiful supply of water may be obtained.

Communication.—There is steamboat connection with Constantinople, Crete, Syra, and other ports.

Port Gavrion is also a telegraph station.

(For further description of Andros Island, see p. 209.)

Digitized by Google

CHAPTER IV.

THE COAST FROM EURIPO STRAIT TO THE KARA SU RIVER, INCLUDING THE ADJACENT ISLANDS.

Euripo—North roadstead.—The space from Kaki Kephali lighthouse northward to the parallel of Cape Gaidaro may be considered the northern port or roadstead of Euripo, as with the exception of the shoals presently mentioned, there are anchoring depths all over it, in from 17 to 10 fathoms, mud bottom, sheltered from westerly winds by Cape Gaidaro and the shoal which extends nearly 1,400 yards northward from it, though in the winter season it would be advisable to anchor within about 1 mile of the town of Euripo.

Water.—There is no water to be procured on this side of the bridge.

The strait northward of the bridge is bordered on either side by shallow water, but which leaves in the central part a narrow but clear passage. From the point of the quarantine establishment (in ruins) on the mainland, 800 yards from the bridge, rocky shoal ground extends off 100 yards, and also from the point on the opposite side of the strait; the extremities of these shoals are marked by light-buoys. The passage between these shoals is about 120 yards wide, and when the buoys are in position there will be no difficulty in keeping in mid-channel.

Telegraph cable.—A cable crosses the strait between the shoal spits just mentioned.

Rocks.—A patch of shoal ground with less than 1 fathom water on it lies with its shallowest spot bearing 65°, 332 yards from Kaki Kephali Lighthouse; shoal water under the depth of 4 fathoms extends 300 yards farther eastward.

A shoal with 4½ fathoms water over it lies 1,600 yards 23° from Kaki Kephali Lighthouse. Other points of the coast of Eubœa northward of it, forming the anchorage, are foul ½ mile off.

Lights.—At about 100 yards from the end of the point on the western side of the entrance to Euripo Strait and about 400 yards northward of the quarantine establishment is a frame lighthouse, from which is exhibited, at an elevation of about 39 feet above the sea, a fixed white light, visible 7 miles.

On the eastern side, at 40 yards within Kaki Kephali Point, from a lighthouse 40 feet high, a fixed red light is exhibited, elevated 68 feet above the sea, and visible 14 miles; partly obscured. (See Light List.)

Digitized by Google

(The preceding portion of this chapter is copied from pp. 135, 136. For description of the channels southward of Euripo, the bridge, and tidal changes, see pp. 131–135.)

Lightbuoys.—A cylindrical red buoy, showing a flashing red light every 3 seconds, visible 6 miles, moored in 20 feet of water at the western extremity of the shoals making off from Tekies Point, coast of Eubœa.

A cylindrical green buoy, showing a flashing green light every 3 seconds, visible 5 miles, moored in 18 feet of water at the eastern extremity of the shoal making off from Quarantine Point, coast of Bœotia.

Directions.—Vessels should always pass between the two lightbuoys, which are moored 135 yards apart, but never between one of them and the shore. These buoys, and especially the one off Point Tekies, are moored in a strong current and should one be carried away navigation should pass close to the one remaining, leaving it to the eastward if the light shows red and to the westward if it shows green.

Talanta Channel (Evoikos), northwestward of Cape Gaidaro, is clear of danger at a short distance from the shore, which generally is steep-to on either side of the channel. The high range of the Kandili Mountains in Eubœa, which reach nearly 4,000 feet above the sea, a little within the coast, extend over a distance of 7 miles. The violent gusts of wind which descend from these mountains during northeastward and northerly winds, and also the heavy squalls which may blow from the highland on the opposite side of the channel, should be carefully guarded against in vessels under sail.

Southwest shore.—Cape Gaidaro is 3½ miles from the northern entrance to Euripo Strait. Shoal water extends for a distance of 1,200 yards to the northward of the cape, and in the bight on its west side is Gaidaro Islet, separated from the shore by a narrow passage 9 fathoms deep. A small group of dry and sunken rocks lies about 700 yards off the northern end of the islet, with 11 fathoms water between. At 1½ miles inland from the shore of the bight Mount Ktypa (ancient *Messapus*) rises 3,356 feet.

Port Scroponeri.—At 6½ miles westward of Cape Gaidaro is the little islet of Gatza, at the entrance of Port Scroponeri, a bight running nearly 3 miles west-southwestward, and surrounded by highland; the port does not seem to be resorted to by the natives, there is no village, and the water is deep for ordinary anchorage, being from 20 to 18 fathoms.

The peak over Cape Tamera, the southeastern point of entrance, is 820 feet high and the eastern termination of the Scroponeri and Strutzina Mountains. Cape Gatza, the northwestern entrance point, is 1.3 miles 311° from Cape Tamera, and the water is deep

Digitized by Google

on either side of the little islet of the same name which lies between, but the passage southward of the islet is the wider.

Port Larmes.—This little port, the *Larymna* of the ancients, is 5 miles northwestward of Port Scroponeri; it is a narrow inlet running southwestward nearly 2 miles, having from 20 fathoms water at the entrance to 4 fathoms near its head, where there is a stream of drinkable water, and a bridge, with a mill within it which the stream turns. On the northwestern side of the entrance to the port is St. Georgio, a rocky shoal with less than 6 feet water on it, lying ¼ mile from the shore.

Within the entrance on the western side there are the remains of an ancient fortification of red sandstone, the blocks being rectangular, from 2 to 3 feet in length and half that in breadth.

Lake Topolias or Copias, whose waters discharge into this port, as well as Lakes Likiri and Paralimni, which are connected with it by a canal, have been partially drained and brought under cultivation.

Coast.—Cape Larmes is 2¼ miles northeastward of the port of the same name, whence the base of the highland trends round to the northwestward to Cape Theologos, a distance of about 8½ miles, beyond which on the west is Cape Kerata, with an old tower on it, and the eastern point of Atalanti Bay. The coast between Capes Theologos and Kerata fronts the north, is 1¾ miles in length, and immediately within it Mount Theologos rises 705 feet and is covered with trees and bushes.

Vessels rounding Cape Kerata should give it a wide berth, as a shoal extends ¼ mile northward of it.

Atalanti Bay.—Cape Akritsa, a low sandy point, is 8 miles northwestward of Cape Kerata, and between the two, is Atalanti Bay, open to the north; the southern part of the bay (Sinus Opuntius) extends east and west 4½ miles, with from 18 to 10 fathoms water, sand and shells. On the western side of the bay are the two islands of Atalanti and Gaidaro; the latter is nearly united to the shore by low marshy land and covers a bight, about 1½ miles deep, called Port Armyro, which has from 5 to 3 fathoms water. A rock with 7 feet water upon it lies nearly in the middle of the entrance, which is about ½ mile wide.

Light.—A group flashing light showing two white flashes followed by a red flash is shown, at an elevation of 47 feet, from a circular masonry tower, 42 feet high, on the extremity of Cape Akritsa, visible 12 miles. (See Light List.)

Mount Khlomo, 3,520 feet high, nearly 5¼ miles westward of Port Armyro and about 7 miles northward of the mount, is Xero Vuni, 2,340 feet high, and 4¾ miles from Cape Akritsa.

Atalanti Island, northward of Gaidaro, is more than 1 mile in length north and south, 410 feet high, and its southern end is only

Digitized by Google

separated from the shore by a narrow passage 5 to 8 fathoms deep. The island lies at an angle with the coast, and in the bay thus formed westward of the island there is anchorage in from 6 to 10 fathoms, good holding ground. The best berth is about 700 yards westward of the small islet situated close to the center of the western coast of Atalánti Island, taking care in a heavy-draft vessel to avoid the isolated patch of 4½ fathoms between this position and the islet; although the anchorage is open to the northward, the furious gusts of winds which blow over the highland of Eubœa do not reach this shore.

The skala, or landing place, is on the shore abreast of the island, and the town of Atalanti is 3¼ miles inland, surrounded with gardens containing abundance of fruit and vegetables, and the whole plain is in a high state of cultivation. Many remains of ancient ruins are found in the vicinity of the bay.

Light.—A fixed red light, visible 5 miles, is shown at an elevation of 40 feet, from an iron support, 20 feet high, on St. Nicholas Islet, which lies about 400 yards westward of the northern extremity of Atalánti Island. (See Light List.)

Communication.—Steamers running between the Piræus and Volo occasionally call here. The town of Atalanti is a telegraph station.

Livantes.—At 2¼ miles northward of Atalanti Island is Livantes, a slightly salient point, and on the face of the adjacent hill is the village of the same name; at about 1¼ miles northwestward of the point the coast is skirted by rocks, some appearing above water. The whole western shore of Atalanti Bay to Cape Akritsa should be given a wide berth.

Vorlovu Bay.—From Cape Akritsa the coast trends westward, and at the distance of 6 miles is Cape Longos; the low sandy shore between forms an inward curve and is backed by highland. Cape Longos is low and sandy, and 1,400 yards southward of it is the village of the same name. At 3¾ miles farther west is Vromo Limni, and between is Vorlovu Bay, about 1¾ miles deep, with the village of the same name on the western shore near its head. The depths in the bay are from 15 to 30 fathoms, shoal water extending in places ¼ mile from the shore.

Vromo Limni is a low projecting point with trees on it, and forms with the Likhades Islands on the north the western limit of Talanta Channel.

Vromo Limni Point—Light.—From a white iron tower, with a red band, situated on Vromo Limni Point, is shown, at an elevation of 19 feet, an unwatched flashing light with white and red sectors; the white and red lights are visible 9 and 8 miles, respectively. (See Light List.)

Digitized by Google

The northeast shore of Talanta Channel is steep-to and without danger beyond ¼ mile from the shore.

Mnima Point—Light.—An unwatched flashing white light is established on Mnima Point.

The light is exhibited, 19½ feet above the sea, from a white iron beacon tower, 10 feet in height, erected on a masonry base, 33 yards inside the point, and is visible 10 miles. (See Light List.)

Limni.—Midway between Euripo and Ædipsos Gulf, on the northeastern side of Talanta Channel, is the town of Limni, situated in a small bay with very deep water.

Light.—On the western point of Limni Bay is erected a metal, post 26 feet high, which exhibits, at an elevation of 87 feet above the sea, a fixed red light, visible 6 miles. (See Light List.)

Mooring Buoy.—A red mooring buoy, marked "AIMNH" in white, is moored in 43 fathoms of water 250 yards from the landing mole at Limni.

Communication.—Steamers plying between Piræus and Volo call here.

The Deutsche-Levante steamers call here monthly on their passage from Batum to Hamburg.

Limni is a telegraph station.

Cape Therma, so called from hot springs near it, is the eastern entrance point of Ædipsos Gulf, and at 3 miles eastward of it Mount Balanti (ancient Telethrium) is 2,890 feet high. The heat of the sulphuric springs is at the boiling point.

Gialtra Bay.—On the northern side of Talanta Channel and about 8 miles from the western end of Eubœa is Ædipsos Gulf, an identation about 2 miles square, the narrow continuation westward being known as Gialtra Bay. This bay is the only sheltered anchorage on the coast of Eubœa between Euripo and the Likhades Islands, but the water in the central part is rather deep, and no supplies can be procured.

Communication.—Steamers running between Piræus and Volo call here in summer. The village of Ædipsos is situated near the eastern shore of the gulf, and is a telegraph station.

Likhades Islands.—The passage between Likhades Point (the western extremity of Eubœa) and the mainland on the south is much contracted by a cluster of islets, rocks, and shoals, which extend southward 1.1 miles, and are named Likhades Islands.

Megalo Likhades, the largest and most northern of the group, is 1,200 yards in extent, with traces of extensive ruins on it and surrounded by sunken rocks and shoal water. The islet is about 700 yards from Likhades Point, and a narrow passage between the shoals on either side carries 4 and 5 fathoms water, but the tides run

39148—16——10

Digitized by Google

through with great rapidity and change in a similar manner to those of Euripo Strait, consequently this channel is only fit for boats or country vessels with local knowledge.

Rat Isles consist of about 15 small islets and rocks, extending over a distance of little more than 700 yards and lying on the rocky bank continuing from the southern portion of Megalo Likhades; they are surrounded by shoal water, and a spit with 2½ fathoms on it projects 800 yards 254° from the southern islet.

Strongilo (Strongyli) Islet, the southern of the Likhades group, is a small round islet, about 104 feet high, on which is a white stone lighthouse; a sandy spit projects from it a little more than 200 yards to the northward, leaving between it and the 5-fathom curve round Rat Isles a clear space about 250 yards wide and 6 fathoms deep, named Strongilo Passage.

Light.—The lighthouse on Strongilo Islet is a white stone building, 30 feet high, which exhibits, at an elevation of 134 feet above the sea, a fixed white light, with white and red sectors; red light visible 12 miles, white 16 miles. (See Light List.)

A shoal with 3 fathoms water on it and 15 fathoms between it and the islet lies 300 yards eastward of Strongilo.

Research Rock, with 3½ fathoms on it, and steep-to, lies 1,300 yards 113° from Strongilo. It is also nearly 1 mile 34° of Vromo Limni, the southern entrance point of Talanta Channel.

Vromo Passage.—The channel between Strongilo and Vromo Limni is 1 mile wide, and with the exception of Research Rock is deep and clear, and named Vromo Passage.

Tides.—It is high water, full and change, in Vromo Passage at 9 h. 30 m.; springs rise 2½ feet, neaps 1¾ feet.

Tidal streams.—The flood, or easterly stream, commences to run into Talanta Channel at about 3 hours after low water by the shore, and the ebb to run out 3 hours after high water, but both streams are much affected by the winds. The velocity of the streams under ordinary conditions is about 1½ knots per hour.

Gulf of Zeitun or Stylida (Lamia).—This gulf extends westward 14 miles from the western end of Eubœa, but the gulf proper, from the points of entrance to its head, is limited to about 8 miles. The points of entrance, Cape Kiliomeli, the southern, and Cape Ekinos, the northern, are 1¼ miles apart, low and steep-to. Halfway to the head the gulf widens to 3 miles between the shoal water on either side. Its southern shore and head is irregular, with shallow bights, some of which are 1 mile deep, and a large extent of low swampy ground, through which the Ellada River runs into the sea, at the base of Mounts Suvalla, 4,140 feet, and Alaph, 3,560 feet high.

Note:—The southern shore is reported to be extending.

Digitized by Google

Light.—At 87 yards southwestward of the sandy extremity of Cape Kiliomeli, from a circular iron lighthouse 26 feet high, and at an elevation of 30 feet above the sea, is exhibited a fixed white light, varied by a red flash; visible 9 miles.

Stylida.—The town of Stylida stands at the head of a shallow bight on the northern shore, and the village of Agia Marina on the same shore is 1¾ miles southwestward of it. An iron wharf extends 460 feet from Agia Marina on which are steam cranes.

The port of Stylida is easy of access for vessels drawing less than 16 feet of water.

Buoys and beacons.—The entrance to the channel is marked by two lightbuoys, showing a fixed green light on the starboard side and a fixed red light to port. Inside the port are four beacons, on stakes, marking the edge of the shallow water. On the quay at the head of the port is a fixed green light, showing a white sector over the entrance to the channel. Vessels entering should be in this white sector to pass between the two lightbuoys at the entrance.

Communication.—Steamers running between Piræus and Volo, call daily at Stylida. It is also a telegraph station.

Anchorage.—There is anchorage in from 10 to 15 fathoms all over the gulf, but the usual anchorage is off the village of Agia Marina. Vessels should keep as far over on the northern shore as possible, as the winds which blow along the base of the chain of mountains on the north are not so likely to be charged with miasma as the night air in the southern part of the gulf. The nearest anchorage to the Pass of Thermopylæ is off Agia Triada, on the south shore; the bottom is soft mud, but very tenacious.

Oreos Channel.—This channel, leading to and from the Gulf of Zeitun and the Talanta Channel, is bounded on the northwest by the mainland and on the southeast by the northwestern coast of Eubœa, and takes its name from the district of Oreos in that island. It runs in a general west-southwest and east-northeast direction for about 18 miles and is 1¼ miles wide at its narrowest part.

Tidal stream.—A tidal stream sets through Oreos Channel 1½ miles an hour and at the same rate in and out of the Gulf of Zeitun.

Coast.—The shoal bordering Likhades Point, the western extremity of Eubœa, continues along the coast northward, and at 1¼ miles northward of the point rocks are reported to extend off nearly ½ mile.

Cape Vasilina.—From the reef just mentioned the coast trends a little more easterly 1¾ miles to Cape Vasilina, which with Cape Spilia on the mainland contracts the channel to a width of 1¼ miles. The cape is low and sandy, like the shore between it and Likhades Point.

Mount Elias, 2,200 feet high, rises about ¾ mile to 1 mile from the cliffs at its base, eastward of the cape. The sandy shore, which is a little salient between the cliffs, is bordered by shoal water.

Digitized by Google

Light.—A flashing light showing green over the dangers to the southward and white elsewhere is exhibited, at an elevation of 33 feet, from a square masonry tower, 31 feet high, on Cape Vasilina; it is visible 11 miles in the white and 6 miles in the green sectors. (For sectors, see Light List and Chart.)

Cape Drepano, on the main or north coast, is nearly 3 miles eastward of the entrance to the Gulf of Zeitun, and is a low sandy tongue, steep-to. The shore eastward, nearly to Cape Spilia, is also low and sandy; this latter cape, as before stated, is 1¼ miles northward of Cape Vasilina and the two form the narrowest part of Oreos Channel.

Gardiki Bay, between Cape Spilia and the spur of an elevated ridge on the east, is nearly 1½ miles deep, with anchorage in 14 to 18 fathoms at its head; the eastern shore is bordered by a shallow bank, close to which the water is deep. The land in the vicinity is well cultivated, two or three streams disembogue, and the village of Gardiki stands on a hill 1½ miles within.

Telegraph.—The village of Gardiki is a telegraph station.

Nikolaos Islet, with a chapel on it, lies about 2½ miles eastward of Bardiki Bay, at the foot of Mount Elias on the mainland. A shoal extends from it to the north, and between it and the shoal bordering the shore is a narrow passage with 17 fathoms water.

Port Vathi.—At about ½ mile northward of Nikolaos Islet is a small circular inlet almost landlocked, with 8 to 22 fathoms water, named Port Vathi; the entrance is shoal on either side. Northeastward of Port Vathi is the bay and village of Glypha.

Cape Agios Sostis, the eastern extremity of Glypha Bay, is a projecting point with a narrow shoal extending from it which borders the shore northward; the eastern side of the cape consists of white cliffs.

Argiro Nisi, an island 5 miles northeastward of Cape Agios Sostis, is about ¾ mile in length east and west; a large rock lies off its southern extremity, and shallow water extends 200 yards beyond it, with 35 fathoms close to the edge of the bank. The island is connected to a narrow projecting point of the coast by a rocky ridge, on which is a small islet; the ridge is steep-to on either side, and there are 4 and 5 fathoms water on it between the island and islet, but it is no passage for a vessel. Argiro Nisi is 1½ miles southward of Cape Stavros, the northeastern point of the entrance to Oreos Channel and the southern point of the entrance to the Gulf of Volo.

Light.—On the eastern extremity of Argiro Nisi is a cylindrical masonry tower 21 feet high, from which, at an elevation of 114 feet above the sea, is exhibited an alternating flashing white and red light, visible 16 miles. (See Light List.)

Digitized by Google

Oreos Bay, on Eubœa Island, about 3½ miles southward of Argiro Nisi, affords fair anchorage in 16 or 17 fathoms, sandy bottom; the best berth is ½ mile from the shore, northwestward of the skala, off the ruins of Oreos, which are on a hummock rising suddenly from the plain. In 1896 the population of the present village of Oreos numbered 692. On the western side of the bay is a little islet with the ruins of a turret on it, and northwestward of the islet are rocks above and below water, with deep water near them.

The pretty and prosperous little town of Xero Khori is situated in a fertile plain, about 1½ hours' journey eastward of the skala, and contains a population of about 3,500.

Light.—A fixed red light is shown, at an elevation of 24 feet above the sea, from a post 19 feet high on the end of the pier at the skala; it should be visible 5 miles. (See Light List.)

Oreos Shoal.—This danger is 700 yards in length north and south, with two rocky heads having less than 6 feet water on them and 3 fathoms between. The southern rock lies 1,400 yards 329° from the islet on the western side of the bay. The northern rock lies 2¾ miles 76° from Cape Agios Sostis. The shoal is steep-to, and may generally be recognized by the discolored water.

A clump of trees on the plain northeastward of Oreos, in range with the foot of Asmeni Ridge, bearing 67°, leads northward of the shoal; the shoal will also be cleared by keeping the western extremity of Skiathos well open of Cape Kephala, the latter bearing 55°, until the town of Trikiri is shut in with the highland of Cape Stavros.

Light.—On the center of Oreos Shoal, from a white iron column with a red band, is exhibited, at an elevation of 21 feet, an unwatched flashing white light, visible 7 miles.

The light is exhibited 20 feet above the sea from a structure consisting of an iron pyramid surmounted by a marble column. At about midheight of the structure there is an iron balcony. The structure is painted white with a red band. (See Light List.)

Communication.—Steamers running between the Peirœus and Volo call at Oreos Bay occasionally. The village of Xero Khori, just alluded to, is a telegraph station.

Coast.—At nearly 2½ miles southwestward of Oreos Bay is a low swampy point, from which a rocky shoal extends off about 400 yards, and parts of it are a very little under water. To avoid it keep the western point of Skiathos 40° open of Cape Kephala, the extremity of the lowland of Eubœa. To avoid these dangers at night, keep on the northern side of the channel. (For Trikiri and Volo Channels, see p. 156.)

Northeast coast of Eubœa.—From Cape Doro, at the southeastern end of Eubœa, the northeast coast of that island trends in a west and then north direction, and consists principally of high

Digitized by Google

precipitous rocks without even shelter for the smallest description of boats, nor scarcely a place where a boat can land. The castle of Philagra, apparently a Venetian fortification, is about 10 miles from Cape Doro, and 17 miles farther northward is Port Petries.

Port Petries is a little bight forming the north shore of an indentation nearly 2 miles long north and south by 1½ miles in breadth. The port affords shelter from northeasterly winds and anchorage for small vessels within about 400 yards of the shore, in 10 fathoms water, sandy bottom. It would appear from the growth of herbs and strong brushwood close to the shore that southerly winds, which generally blow hard in the winter season, do not come home in this little port. A road from here leads across to Aliveri Bay, Euripo Channel.

Cape Octonia.—At 7½ miles beyond Port Petries is Cape Octonia, the eastern termination of the mount of the same name, which, at 2½ miles inland, is 2,380 feet high; the cape is a projecting point, the southeastern extremity of Kumi Bay. Southward of the cape about ½ mile are two large rocks or little islets, the outer of which is known as Karvuno Islet.

Kumi Bay is formed between Cape Octonia and Cape Kumi, 8 miles 332°, receding from the line of these capes nearly 3 miles; vessels are sometimes built here, being near the pine forests of Mount Delphi.

Harbor.—A harbor for small craft is formed by two breakwaters, the southern of which extends 400 yards at right angles to the shore; the northern one is about 900 yards long, the outer end overlapping the southern breakwater, leaving a narrow but apparently deep entrance between them.

The commanding officer of the French naval vessel *Fanfare*, a destroyer having a length of 196 feet and a draft of 12 feet, reports that in January, 1915, his vessel was moored without difficulty in Kumi Harbor, a port which, according to the Sailing Directions, is accessible only to small vessels.

Large vessels anchor temporarily in 10 or 12 fathoms ½ mile eastward of the harbor.

Light.—A fixed red light is shown, at an elevation of 28 feet, from a metal shed on the head of the northern breakwater. (See Light List.)

Kumi town is situated about 1 mile from the harbor in a direct line, and is about 3 miles by the road, which follows the base of the hill. The population, amounting to about 5,000, are chiefly seafaring, though a considerable trade is done in oil, wine, and lignite.

Communication.—The steamer from Piræus and Lavrion to Skyros calls here once a week. The town of Kumi is also a telegraph station.

Digitized by Google

Glaro Islet.—The bank bordering the coast within the 100-fathom curve extends from the shore of Kumi Bay about 4 miles, and has from 64 to 15 fathoms water on it; near its edge and 5 miles 355° from Cape Octonia is the little islet of Glaro.

Prassudo Islet.—At nearly 3½ miles 17° from Glaro and 4 miles from Cape Kumi is the islet of Prassudo, about 80 feet above the sea, flat, with high cliffs, lying on the southern end of a bank with from 35 to 75 fathoms on it. The islet and lighthouse are important marks for this part of the coast of Eubœa.

Light.—On the summit of Prassudo Islet is erected a circular tower of masonry, 57 feet high, from which is exhibited, at a height of 140 feet above the sea, a flashing white light, visible 18 miles. (See Light List.)

Islets.—From Cape Kumi the coast takes a westerly direction and at the distance of 23 miles is Cape Sarakeniko. A little westward of Cape Kumi are the islets of Plati and Kili; about 10 miles farther west is the islet of Kheliatho, 190 feet high, and a little over 1 mile beyond it is Tria Nisia. All these little islets are close to the shore and the water is all along deep.

Coast.—At 3 miles westward of Cape Sarakeniko is a small sandy bight and in its vicinity is a little village; between 5 and 6 miles farther on its Port Mantudion, or Kimasi, another small bight with a village near it; these little bights are frequently visited by small coasting vessels, which are always hauled up on the beach. Although quite open to the northeast, vessels occasionally take in cargoes of manganese at Port Mantudion.

Telegraph.—The village of Mantudion, situted about 2 miles westward of the port of that name, is a telegraph station.

Lephko Islets, the inner of which is 130 feet high, form a cluster of small islets and rocks on a bank extending 1.3 miles from the shore; they lie nearly 10 miles north-northwestward from Port Mantudion and form a salient point of the coast.

Pondiko Nisi is about 7½ miles 315° from Lephko Islets, and halfway between are Myrmikonisos Rocks, one of which is above water. These rocks are about ¼ mile in extent, steep-to, and the inner rock is about ½ mile from the shore, with 35 fathoms water midway between. Pondiko Nisi is 1,200 yards in length east and west, 230 feet high, and lies a little more than ½ mile from Cape Artemision, the northern extremity of Eubœa, and on the southern side of entrance to Trikiri Channel. Between Pondiko Nisi and Cape Artemision there are from 10 to 40 fathoms water, and a short distance southeastward of the island is the smaller islet of Praso Nisi.

Light.—A light showing fixed white with fixed red and occulting white sectors is exhibited, at an elevation of 203 feet above the sea, from a circular masonry tower, about 62 feet high, situated on the

Digitized by Google

north coast of Pondiko Nisi; visible 21 and 14 miles in the white and red sectors respectively. (For sectors see Light List and Chart.)

Mount Psara rises over this end of Eubœa, 1,320 feet high. The coast hence to the low shore of Cape Kephala has no off-lying danger, and the distance is about 9 miles.

Current.—When navigating the northeast coast of Eubœa, great attention should be given to the probable set of the current, more especially during the northeasterly winds. In the great bight between Capes Doro and Octonia the almost unbroken line of precipitous coast is exposed to the full force of the strong northeasterly winds, which send in a heavy sea, and also accelerate the southwesterly current from the Dardanelles.

From abreast of Cape Octonia to about the middle of the bight a current of 1½ knots an hour to the southward has been experienced, and thence to near Cape Doro an increased rate of 2 knots an hour in the same direction, and being deflected to the southward and eastward, it at times sweeps round Cape Doro at the rate of 3 knots an hour.

Skyros Island (pronounced Skiros) is the chief of the northern Sporades, or islands lying northeastward of Eubœa. The population is about 3,500. It is 15½ miles in length in a northwest by north and southeast by south direction, irregular in form, varying from less than 2 to 6½ miles in breadth, and its greatest elevation, Mount Kokhilas, in the southern part, is 2,565 feet high. The southern part of the island is uncultivated; the high mountains are intersected by deep gullies and are rugged, except toward the summits, where they are clothed with oaks, firs, and beeches.

The northern part, though mountainous, is of less elevation. The vine and corn grow on the hills; oaks, planes, and fruit trees in the valleys. Corn, figs, and the vine flourish on the plains, one of which is about 4 miles in extent. The wheat of Skyros is equal to the best in the archipelago; wine, corn, wax, honey, oranges, lemons, and madder are exported in large quantities. The island is well watered and affords pasture to a few oxen and numerous sheep and goats, many of which are exported. Skyros, the chief town, is on the northeastern side of the island; the houses are flatroofed and generally of two stories, of which the lower one is built of stone and the upper of wood.

Communication.—In addition to the telegraph, there is regular steamer communication with Piræus, Volo, and other ports.

The Deutsche-Levante steamers call monthly on their passage from Batum to Hamburg.

Light.—A flashing white light is exhibited from a cylindrical masonry tower, 41 feet high, with dwelling attached, situated on

Digitized by Google

Lithari Point. The light is 314 feet above the sea, and visible 25 miles. (For obscured sectors, see Light List and Chart.)

Port Trebuki (Tristomon), about 4¼ miles westward of Lithari Point, is a bay about 1½ miles wide and nearly the same deep, with from 25 to 35 fathoms water in the central part, but with anchoring depths along the northern and eastern shores.

Channels.—At the entrance are the two islands of Plati and Sarakino, the latter being much the larger. They form three passages into the port; the western is named Marmora Channel, the middle Piato Channel, and the eastern Sarakino Strait. These passages carry deep water in mid-channel, but the shores on either side, except the eastern side of Piato Channel, are bordered by narrow shoals; Marmora Channel is the best.

The port is considered an excellent place of shelter when vessels bound through the archipelago are caught in a gale of wind. The wind, however, comes down from the mountains in heavy gusts. In taking Piato Channel keep the eastern shore aboard.

Kalamitza Bay.—This extensive bay, 3 miles northwestward of Port Trebuki, is separated from it by a hilly peninsula which terminates on the southward in Marmora Point and on the north in Cape Nikolo; off the latter cape are the Diavati Islets, of a reddish color. Kalamitza Bay is protected on the west by Valaxa Island, 2½ miles in length and 670 feet high. The entrance between Latomeio Point, the southern end of Valaxa, and Exo Diavati and Diavati Islets, on the southeast, is 1 mile wide. The islets should not be approached too closely.

Valaxa Island—Light.—On Latomeio Point, from a white iron tower with a red band, is exhibited, at an elevation of 59 feet, an unwatched flashing white light, visible 10 miles. (See Light List.)

Arazo Road.—At the head of the bay is a valley which separates the mountainous land on the northwest from that on the southeast and gives to the island at a distance the appearance of being divided into two parts. In front of the valley is a semicircular bay with a white sandy beach, affording anchorage in from 19 to 10 fathoms water, mud, gravel, and weed, good holding ground, and named Arazo Road. The water, unless pretty close in, is deep and the bottom steep, and during strong northerly winds, which prevail in summer, care should be taken not to start the anchor.

Linaria Cove, to the westward of Arazo Road, also affords good anchorage, but the water is rather deep. Here there are only a few fisherman, principally engaged in the lobster fishery.

There are narrow passages midway between Exo-Diavati and Diavati Islets, and also between the north end of Valaxa Islands and the tongue of land projecting from Skyros, which may be used by small vessels. Of this latter passage, the commanding officer

Digitized by Google

of the British naval vessel *The Torch*, in 1874, writes: "*The Torch*, drawing 12 feet 3 inches of water, passed through between Valaxa Island and Skyros, but it is not at all prudent to use this passage, even by vessels of 12 feet draft. I do not consider it to be more than 100 yards wide at most, tortuous, and the navigation difficult; we had but an inch or two to spare while going through."

Linaria—Light.—On the eastern shore of Linaria Cove, at 700 yards 213° from the southern extremity of Psarina Point, a fixed white light with green sector is exhibited, at an elevation of 75 feet, visible 6 miles. The green light shows only over Linaria anchorage The light is obscured over the land toward the northeastward.. Mariners should pass at least 55 yards from the light. (See Light List.)

Stinangali (Pephko) Bay, northward of Valaxa Island, is principally used for loading marble. On the northern side of the entrance is Buves Islet and it is further protected by Skyropulon and Erinia. There is a small pier to which vessels secure with anchors to seaward, but as the bottom is rocky and a ground swell frequently runs into the bay great care must be exercised; and in the event of a westerly wind setting in it is necessary to go to sea.

Skyropulon.—This island, 5 miles westward of Valaxa, is 1¼ miles in diameter and 617 feet high; its eastern side is bordered by a rocky shoal, which extends off nearly 600 yards, on the northeastern extremity of which is a large rock; a rock also shows above water nearly 700 yards southwestward of it. Midway between Skyropulon and Valaxa Island is Erinia Islet, narrow, but 1 mile in length north and south; the middle of its western side is bordered by shoal water and its southern end is foul a short distance off and should not be rounded too near.

Erinia Rocks consist of three patches with 5, 6, and 8 fathoms water on them, respectively, the outer patch with depth of 6 fathoms lying 1.8 miles 204° from the southern end of Erinia Islet. All three rocks lie southward of a line joining the southern extremities of Skyropulon and Valaxa Islands.

Clearing marks.—The little islet of Buves (1.3 miles northwestward of Valaxa) shut in with the southern end Erinia Islet, bearing 57°, leads northwestward of the rocks; and Diavati Islet, 87°, well open of the southern end of Valaxa Island, leads southward of them.

Caution.—Although the least known depth on these patches is 5 fathoms, it would be well to avoid them in a large vessel.

Coast.—Mount Oros, 1,050 feet high, rises over Cape Oros, the western extremity of Skyros; the cape is steep-to, and the 100-fathom curve of soundings passes within 700 yards of it. Between the cape and Stinangali Bay are Oros and St. Phokas Bays, open to the southwest and south, with deep water, except close in, where

Digitized by Google

small craft occasionally seek shelter from northerly winds. The island of Kuluri lies on the south side of the cape, and four little islets front the bays.

Between Cape Oros and Kartsimon Point, the northern point of Skyros, the coast is irregular, and off it are two or three small islets or rocks, but no danger at the distance of ½ mile.

Kartsimon Point.—The northern end of Skyros terminates in Kartsimon Point, a sharp, rocky projection surrounded by shoal water extending northward ½ mile, and off it are several large and small rocks, above and below water.

South Podia Rocks.—Northward of the rocky shoal just mentioned and separated from it by a narrow deep passage is a chain of rocks covered and uncovered extending 1 mile northward, and on its northern end is an islet 700 yards in extent; this group is named South Podia Rocks.

North Podia Rocks lie on a shoal 1,400 yards in length north and south; they consist of a narrow islet 700 yards in extent, with rocks at each end. The channel between North and South Podia Rocks is a little more than ½ mile wide and midway from 17 to 21 fathoms deep; the shoals extend from the rocks on either side. The outer end of the North Podia Rocks is 2¾ miles 340° from Kartsimon Point.

Vrykolakonisia Rocks.—From Kartsimon Point the northeast coast of Skyros trends 5½ miles 130° to Pureia Point and is skirted by rocks in places ¼ mile off. Pureia Point is low, with two windmills on it, and surrounded by a cluster of large rocks named Vrykolakonisia, with shallow water extending off nearly 1¼ miles and to the southward the same distance.

Vrykolakonisia Spit is a rocky bank with from 6 to 9 fathoms water over it, extending 3 miles 96° from the eastern Pureia Point.

Skyros town, about 1 mile to the southward of Pureia Point, consists of an ancient and a modern town; the former in ruins is on the summit of a conspicuous craglike hill, the latter at the foot of the same hill ½ mile to the northward of the ancient town.

Anchorage.—In 1904, the British naval vessel *Pyramus* anchored in 12 fathoms to the southeastward of the modern town, with the outer Vrykolakonisia Islet bearing 6°. The town is not easily recognized at night, as it is not lighted.

Dimitrius Rock.—A shoal about ¼ mile in extent north and south lies nearly ¾ mile from the shore fronting the town of Skyros. In the center of the shoal is a rocky head named Dimitrius, with 3 feet in it, bearing nearly 175°, 1.2 miles from Pureia Point; elsewhere on the bank there are 2½ to 4 fathoms. Between the shoal and the town there are from 5 to 8 fathoms.

Digitized by Google

Coast.—Southward of the town of Skyros is a small bay called Port Akhili, and hence to Arazo Road, on the southwest side, is the narrowest part of the island, the distance across being only 1.7 miles. The coast from Port Akhili to Lithari Point, the southeastern extremity of Skyros, is composed of irregular steep cliffs, with deep water all along. Mount Kokhilas, 2,565 feet high, is situated 1½ miles from the coast. Rocks, one of which is uncovered, lie about 250 yards off Lithari Point and are steep-to.

Trikiri Channel.—This channel between the northern end of Eubœa on the south and the mainland on the north leads to the Gulf of Volo and Oreos Channel. It is 5½ miles wide at the entrance between Pondiko Nisi and the Magnesian Promontory, narrows within to 4½ miles, and runs 259° rather more than 12 miles, when it divides, one portion trending northwestward to the Gulf of Volo, the other to Oreos Channel. It is approached from the southeastward between the Skopelos Islands and the coast of Eubœa and from the northward through Skiathos Channel; there are no dangers in Trikiri Channel, and the water is deep.

Pondiko Nisi—Light.—See page 151.

Platania Bay.—Good anchorage during northerly winds can be obtained in Platania Bay, at the southern end of the Magnesian Promontory, a little to the eastward of the sandy beach and 1¾ miles westward of Arapi Point.

Gulf of Volo (Pagasitikos).—Volo Channel, the name given to the entrance to the Gulf of Volo, is 3 miles wide between the Trikiri Peninsula and Cape Stavros and between Cape Kavulia (the western extremity of the former) and the western shore. There are no dangers, and within the gulf opens out 18 miles east and west and extends 14 miles northward.

The gulf is surrounded by high land; on the western side of the entrance is Mount Klimo, 2,981 feet high; on the east the peninsula of Trikiri is 1,040 to 2,171 feet high, while to the north Mount Pelion rises 5,316 feet above the sea. The gulf is bounded on the east by the Magnesian Promontory, which extends southward from Mount Pelion, and by the Trikiri Peninsula connected to it by a narrow isthmus on the south.

Light.—A fixed red light is shown, at an elevation of 40 feet, from a mast over a white house, 23 feet high, on Cape Kavulia; it should be visible 6 miles; but its visibility has been reported (1907) to be uncertain.

Trikiri anchorage.—Small vessels visit Trikiri Bay, situated ¾ mile southeastward of Cape Kavulia, and secure with their sterns to the shore. The village is composed of about a dozen houses, the town of Trikiri being on the heights above and not visible from the shore.

Telegraph.—Trikiri Village is a telegraph station.

Digitized by Google

Port Phtilio.—The entrance to this port is on the western side of Volo Channel and 3½ miles westward of Cape Stavros. The port is about 2 miles deep, and in the northwestern part there is anchorage in from 12 to 14 fathoms, sand and mud. On the summit over Cape Pirgo, 490 feet high, is a conspicuous square tower. It was from this place that Achilles is said to have embraked for the siege of Troy.

Two small piers have been constructed on the southeastern side of the peninsula of Ahilion for the embarkation of copper ore. Anchorage may be obtained off them in from 7 to 13 fathoms water. A rock with less than 6 feet of water over it is reported to exist 200 yards offshore on the southern side of the approach to the anchorage, but its existence is doubtful.

Shoal.—A shoal with a depth of 6 fathoms over it is situated nearly in the middle of Port Phtilio 1,300 yards 177° from Cape Pirgo summit.

Nies Bay, situated on the western side of the gulf about 4 miles from its entrance, has depths of from 10 to 26 fathoms and might afford temporary anchorage, but is exposed to the northward.

Port Mijella is also situated on the western side of and about 9 miles from the entrance of the Gulf of Volo. It is sheltered from the southeast by St. Nikolo Island, which is from 50 to 60 feet high, and from the northwest by a promontory separating it from Port Surbi. Between Maxwell Point, the northeastern extremity of this promontory, and Vincent Point, the northern extremity of St. Nikolo Island, the distance is ¾ mile and depth 24 fathoms, whence the soundings gradually decrease to 3 fathoms, with mud bottom 150 yards from the head of the port, eastward of the town; off the town itself depths under 3 fathoms extend 350 yards.

The port is ¾ mile in length by ½ mile in width, and open to north-northeastward. There is not more than 2 fathoms between St. Nikolo Island and the mainland. With the exception of the bank at the head, the depth of 3 fathoms will be found within 100 yards of the shores of the port. The best landing in northwest winds is in the southwest corner of the port. A good anchorage berth is in 8 to 10 fathoms west of the channel inside St. Nikolo Island; a large vessel should anchor farther out.

Mijella town, or **Amaliopolis,** was so named in honor of a former Queen of Greece, and founded with the view of encouraging immigration, and has a population of about 700.

A valley bounds the town on the north and separates the rising ground of the peninsula from the heights of the mainland.

Communication, etc.—Mijella is connected by telegraph with other parts of the world. Steamers from Volo to Peiræus call occasionally at Port Mijella.

Quarantine is performed on St. Nikolo Island.

Digitized by Google

Port Surbi is the name given to the south corner of Almiros Bay. It is separated from the port last described by a promontory connected to the main by an isthmus less than 700 yards broad. The northern extremity of this promontory is called Almiros Point. Queen Olga Hill, 522 feet high, is the highest part of this promontory.

Smith Point is the eastern entrance point to the port, the breadth of the latter here being 1½ miles. From this point the port runs in southward a little over 2 miles, with depths over mud decreasing from 13 fathoms westward of Smith Point to 3 fathoms 800 yards from the head.

The depth of 5 fathoms will be found 200 yards off the eastern shore, while on the western side not more than this depth will be found 600 yards off. The head of the bay cannot be approached with this depth to a less distance than 1,200 yards.

Almiros and Surbiotika Rivers empty into the low marshy head of the port; the latter was the old boundary between Greece and Turkey.

Lefroy Patch, with 4½ fathoms rocky bottom, is the only isolated danger in the port. It bears 203°, 1 mile from Smith Point.

Anchorages.—Port Surbi affords more room and shelter than Port Mijella, but the lowland renders it unhealthful. Vessels may anchor in 7 fathoms about 800 yards eastward from the landing pier at Zingheli and inside Lefroy Patch, or in Fearless Cove, on the eastern side of the port, in 8 fathoms, mud bottom at each place.

Pier.—The landing pier at Zingheli, on the western shore, may be recognized by a red-roofed house. A road leads from the pier to the town of Almiros, prettily situated about 4 miles northwestward.

Communication.—Steamers running between Volo and Piræus occasionally call. The town of Almiros is a telegraph station.

Coast.—From Port Surbi the low marshy shore of Almiros Bay trends northward for 6½ miles, then eastward for nearly the same distance under highland to Anghistri Point, 3½ miles from the town of Volo.

Agio Nicholas, a small islet, lies ½ mile 246° from Anghistri Point and has a sunken rock about 200 yards from its south side.

Coast.—From Anghistri Point the coast turns abruptly to the northwest for 1½ miles and then northeastward for the same distance to Cape Sesklo, which will be again alluded to, in detail, in the description of the port of Volo. Between the headlands mentioned the western shore of the gulf recedes 1 mile, forming a bay, from the head of which a shoal bank extends about 400 yards. This bay is at the mouth of a valley flanked by an amphitheater of hills, the ridge southward of it rising to a height of 1,818 feet, those on the west to 1,427 feet, while the Bulbulithera Hills on the northern side are 660 feet high.

Digitized by Google

From Anghistri Point to the cultivated point on the opposite shore the Gulf of Volo contracts to a width of 3½ miles, forming a square-shaped bay, which at the distance of 2½ miles from its mouth contracts still more, forming the port of Volo, to be described after the eastern side of the gulf.

Eastern shore of Volo Gulf.—From Cape Kavulia, the eastern shore of Volo Channel trends about 3 miles north-northeastward with deep water close to it, and is backed by a ridge rising to a height of 1,287 feet.

Intended light.—A flashing light alternating with a single green flash, and a luminous range of 16 miles will be established on Trikiri (Trikkeri) Point.

Paleo Trikiri is the larger of two islands lying off the northwest part of Trikiri Peninsula. It is 1¾ miles in length northeast and southwest by ¾ mile in breadth and 424 feet high. Between it and the peninsula is a channel 800 yards broad and 35 to 22 fathoms deep.

Shoals.—From Pardalos Point, the northern point of Paleo Trikiri, two shoals, with a depth of 2 fathoms on each, bear 51°, 800 and 400 yards, respectively.

Tsamados Shoal, with 2 fathoms on it, lies 500 yards 40° from Alexi Point, the eastern extremity of Paleo Trikiri. In other parts the island is steep-to.

Pithu Islet is situated 1,600 yards northwestward of Paleo Trikiri. It has dry rocks lying off its southern and western extremities, which, together with the rest of the islet, are steep-to, with the exception of a 6-fathom patch 800 yards 183° from the southern point. Between this patch and Paleo Trikiri there is a channel with a depth of 32 fathoms. Pithu Islet, with Almiros Point on the western side, may be said to mark the boundary of Volo Channel on the north.

Trikiri Harbor.—From Trakhila Point, ¾ mile eastward of Paleo Trikiri, the north coast of the peninsula turns sharply to the southward and southwestward, forming the northwest shore of Trikiri Harbor, where the water is inconveniently deep for anchoring. The head of the harbor reaches to within ½ mile of the shore of Trikiri Channel.

From this narrow corner the broken-up shore of the Gulf of Volo runs in a general northeast direction 6½ miles to Kapri Point, the western entrance point of Port Vathudi.

Presutha Islet.—Nearly in the middle of this portion of the shore of the gulf is a deep bight, in the outer part of which is an islet, 44 feet high, called Presutha Islet.

Between the latter and Port Vathudi are two smaller bays, the western of which is known as Port Varelia, with a cluster of dry and sunken rocks in the middle of its entrance.

Digitized by Google

Shoals.—A rock with 1 fathom water on it lies ½ mile 270° from Presutha Islet. Another rock with the same depth on it lies nearly 400 yards southwestward of it, and a patch with 5 fathoms is situated ½ mile 298° from Presutha Islet.

Port Vathudi is situated in the extreme southeastern corner of the Gulf of Volo, the head of the port reaching within 1 mile of Andriami Bay, in the Trikiri Channel, and marking the junction of Trikiri Peninsula with the Magnesian Promontory. This port is protected by Alatas Island, 1.3 miles long, with an extreme breadth of ¼ mile. It is 200 feet high and separated from the southwest angle of the port by a 2-fathom channel, 200 yards broad. The port is entered between Kapri Point, the northern extremity of Alatas Island, and the straggling village of Melina on the shore ½ mile eastward of it.

The extreme length of the port is 1¾ miles, the width of the channel into it being at ¾ mile southward of Kapri Point reduced to 350 yards, with a depth of 18 fathoms. The port now expands into a roughly circular basin, the diameter of which between the 5-fathom curve is about ½ mile and depth in the middle 17 fathoms, mud bottom. With the exception of the bar connecting the southern end of Alatas Island to the main and the shallow bank extending 200 yards from the broad cove on the eastern side of the port, not less than 3 fathoms will be found 100 yards distant from its shores.

A third of a mile eastward of the narrows the land rises to a height of 530 feet.

Coast.—From the entrance to Port Vathudi the eastern shore of the Gulf of Volo trends north and westward, with deep water close to it, 14 miles, to the cultivated point opposite Cape Anghistri, already mentioned. From this point, fronting the village of Lekhonia, the shore runs north and northwestward, forming two slight bays, for 2¾ miles to Goritza Point, the eastern entrance point of the port of Volo.

Port of Volo.—This port is situated near the center of the northern side of the gulf of that name. It is oblong in shape, being 1¼ miles in length and about ¾ mile broad. From the depth of 10 fathoms, which runs approximately from Cape Sesklo to Goritza Point, the depths gradually lessen as the head is approached, and anchorage may be taken up as convenient, though large vessels usually anchor in about 8 fathoms.

Light.—On Cape Sesklo, or Fanari Point, and 50 yards from the beach, a fixed red light is exhibited, at a height of 82 feet above the sea, from a mast erected over a white house; it is visible 6 miles.

Bank.—A small stony bank lies with its shallowest part, 5¾ fathoms, ½ mile 127° from Cape Sesklo Lighthouse. (See Light List.)

Volo town, with a population of about 17,000, fronts the northeastern shore of the port. The inhabitants are mostly Greek, the

Digitized by Google

Turks occupying the old Turkish town and castle of Volo on the other side of the railroad. The ruins of ancient Pagasæ (a name still in official use) are situated on Cape Seskio, while those of Demetrius still exist on the southern slope of Goritza Hill on the opposite shore.

Landmark.—The new hospital, a two-storied building with red roof, situated on the shore 1,200 yards northwestward of Goritza Point, is conspicuous.

Breakwater.—A breakwater is constructed. Starting from the end of the sea wall on the eastern shore 47° from Yolkas Point it extends 215° for 220 yards and thence 247° for about 640 yards.

There is an opening at the shore end of the breakwater for the use of boats landing at the steps.

Light.—The outer end of the breakwater is marked by two vertical lights shown from an iron column.

Piers.—These are three in number, the outer one, of stone, extending from the fish market about 270 yards, with a breadth of about 60 yards, and having a depth of 18 feet at the outer end; near its extreme end is a shelter house painted red. A sea wall in an unfinished state is built from the inner end of this pier in a southeasterly direction about 500 yards. This wall is continued from the pier in the opposite direction about 320 yards, where there is a small artificial harbor suitable for small craft.

The railroad pier is about 480 yards in length, the outer end being in about 20 feet, the depths gradually shoaling to the shore. On each side of the railroad pier and a little within the outer end a mooring buoy is laid down, in addition to which five others are placed a little outside the pier end.

The western pier, on which is situated the post office and a flagstaff, is about 150 yards in length; it is built of stone, and has 5 feet water at the outer end.

Light.—An unwatched fixed red light is shown from the head of the Railroad Mole 1,740 yards 348° 30′ from Cape Leskla Light.

Quarantine.—The quarantine station is situated upon the island of St. Nikolo, port Mijella.

Coal.—About 10,000 tons of Welsh coal are imported annually and about 3,000 tons are usually in stock; it is brought off to vessels in lighters of from 10 to 50 tons. Small quantities of patent fuel can also occasionally be obtained.

Water.—Good water from artesian wells is procurable in lighters, vessel's steam launches being required to tow them off.

Supplies are fairly plentiful and at moderate prices, but notice is necessary if large quantities are required.

The imports are iron, steel, coal, manufactured goods, paper, rice, sugar, coffee, etc. The exports are tobacco, silk, olives, hides, chrome ore, olive oil, etc.

39148—16——11

Digitized by Google

Communication.—Greek steamers run daily to and arrive from Piræus, the Austrian Lloyd's call fortnightly both ways between Trieste and Constantinople, and steamers of the Johnston Line call from Great Britain and Piræus monthly The Deutsche-Levante steamers call monthly on their passage from Batum to Hamburg There is telegraphic communication with the Piræus and thence to all parts.

Railroad.—The railroad communicates with the interior of Thessaly, viz, Larissa, 37¼ miles, and Kalabakka, 101½ miles. A continuation of the line from Larissa is under construction, which will connect with Athens and also with the Turkish railroad system.

Tramway.—A steam tramway runs to the village of Lekhonia.

Harbor dues.—Vessels are subject to harbor dues.

Tide.—There is a rise and fall of tide at Volo of about 8 inches.

Repairs.—Only very trifling repairs can be effected.

Skopelos or Thessalian Islands.—These islands, belonging to Greece, extend from the southern end of the Magnesian Promontory in Thessaly in an east-northeast direction for about 48 miles and front the entrance of the Gulf of Saloniki. They consist of eight principal and several smaller islands and rocks and are named Skiathos, Skopelos, Khelidromi, Peristeri, Pelago, Iura, Piperi, and Skantzura, besides the smaller islands or islets and rocks. They form an interesting and beautiful group, and their appearance from the sea is most pleasing, particularly Skiathos and Skopelos. The climate is generally agreeable, but sometimes the heat is excessive, and sudden changes in the weather are common, as with but little warning a heavy gale succeeds a calm. The islands are generally healthful, though in the months of August and September fevers are of common occurrence.

Praso Nisi—Light.—From a white iron tower on Praso Nisi is exhibited, at an elevation of 33 feet, an unwatched flashing white light visible 9 miles.

Skiathos, the nearest of these islands to the coast of Thessaly, is 6 miles in length, about 3½ miles in extreme breadth, and mountainous, its greatest elevation being Mount Stavros, 1,448 feet high, at the northeast end. The island is rich in wood and thicket, and the steep sides of the hills with which it abounds, are overspread with evergreen foliage. The vine, the olive, and barley are cultivated here and there. An excellent wine is made and silk is produced with success. A few small vessels are annually built. The population of Skiathos, numbering about 3,000, is almost entirely occupied in seafaring pursuits.

Town.—The modern town of Skiathos is prettily situated on a projecting point on the southeast coast, with densely wooded hills behind it, but the streets are poor. It stands on the site of the

Digitized by Google

ancient town which was destroyed by Philip of Macedon, when, with a view to security from pirates, the inhabitants built their town at the northern extremity of the island on a steep and lofty mass of rock, to which the only access is by a wooden bridge. In 1829 the inhabitants returned to the ancient site. The deserted town at the extreme north presents a singular and picturesque appearance and on all sides, except under the bridge, the precipitous rock is washed by the sea.

Communication.—Besides the telegraph to all parts of the world there is regular steamer communication with Piræus, Volo, and other ports.

Skiathos Harbor, extending from the town northeastward, is an inlet about ¾ mile deep and ½ mile wide at the entrance, narrowing to its head. The northwestern side is bordered by shallow water, which in places extends 200 yards from the shore; close to the shore adjoining the town is an islet 50 feet high. East of it, nearly in the middle of the entrance, is a smaller islet, 15 feet high, having a shallow bank extending from its western side 50 yards and from its northern end 100 yards. A narrow ridge of from 3½ to 5 fathoms extends in a 332° direction to the shore.

The harbor is safe with any wind; the holding ground immediately inside the smaller islet in the entrance is bad, and it is recommended to anchor in 11 fathoms, mud, and good holding ground 28° 300 yards from this islet, so as to have room to veer, as heavy breezes come on without warning from the northward. This little harbor is rendered more secure during southerly gales from the protection afforded to it by the islands of Mirango, Zogria (Pakhia), and Cogriaki, which have deep water between them, through a shoal borders Zogria and extends 600 yards northward from its northern end.

The Lazaretto, consisting of three small houses, with a mole for landing, is on the eastern side of the harbor, opposite the town.

Light.—A fixed red light is shown from a white columnar structure, 25 feet high, and surrounded by a red brick wall in the center of the 15-foot islet (Observation Islet) off Skiathos. The light is elevated 40 feet above the sea and is visible 5 miles.

Obstruction reported.—A vessel reports having struck an obstruction about 400 yards eastward of the 6-foot rock northward of Arkakion Island and 0.98 mile 335° from Repi Island Lighthouse, where 20 fathoms is shown on the charts.

A danger circle marked "Obstruction reported (1915)" will be placed on the charts in the above position.

Tide.—The tide has been observed to rise at Skiathos about 1 foot, the stream apparently turning with high and low water by the shore.

Directions.—Vessels bound for this harbor from the northward between Skiathos and Skopelos should pass eastward of Aspro, Arka-

Digitized by Google

kion, and Repi Islets, as there is no safe passage inside them. After rounding the latter islets at a prudent distance, steer for Mirango, give it a berth of at least 200 yards and pass southward of it and eastward of the little islet at the entrance of the harbor.

When entering the harbor from the westward the passage between Kavo Kalamaki (the southern extremity of Skiathos) and Zogriaki is deep and clear. When passing eastward of Zogria do not go too near, and give its northern end a berth of ½ mile.

There is no other safe anchorage in Skiathos, the bays on the northwest and southern sides having deep water and rocky bottom. The bays on the southern side, as well as Skiathos Harbor, have a small lagoon or swamp at their heads, and the inhabitants say that fevers during the summer season are common; the town is yearly visited by sickness.

Supplies.—It is difficult to procure any animal food but goat's flesh and poultry is scarce. A little firewood and fruit may be obtained and a small quantity of water from two wells behind the town.

Skiathos Channel.—This channel, between the island of Skiathos and the coast of Thessaly, is a little more than 2 miles wide, with sunken dangers and irregular soundings.

Repi Island Light.—A group occulting white light, with red sector, is established on the highest point and 273 yards from the eastern extremity of Repi Island.

The light is exhibited, 138 feet above the sea and 33 feet above the ground, from a circular masonry tower, with keeper's dwelling close by.

The white light is visible 17 miles and the red light visible 10 miles. (For sectors, see Light List and Chart.)

Cape Sepias, the eastern point of the Magnesian Promontory, is very steep, 365 feet high, and of a very dark color; the next point to the northward being reddish. These two points form an excellent mark for vessels coming from the north to distinguish Skiathos Channel from Skopelos Channel.

Currents.—The currents are variable and influenced by the winds, but generally set to the northward at from 1 to 2 knots an hour. At 2 miles southward of Cape Puda, the southwestern extremity of Skiathos, during a calm, a current was found setting east-southeastward at the rate of 2 knots an hour. In light winds a vessel under sail should give the dangers a wide berth.

Dangers.—Lethtari Rock (ancient *Myrmex*) is the crown of a rocky shoal about 100 yards in extent, with deep water on its southern side and from 25 to 30 fathoms, close-to, all around. It can generally be seen by keeping a good lookout, as it is just awash, though at times when the sea is smooth it may not be detected until close to it;

Digitized by Google

with a little swell only it has been observed that the sea did not break. The rock lies 1 mile from the coast of Thessaly, or about one-third the distance across to Cape Puda, the southwestern point of Skiathos, and with Marino Rock in range with Kavo Kalamaki, bearing 100°. A few years ago there were the remains of an ancient building on Lephtari Rock; the hewn stones of which it was built were plainly to be seen.

Kastro Nisia, the outer islet at the northern end of Skiathos, twice its length open of Cape Gurnais, bearing 49°, leads eastward of Lephtari Rock and westward of Agia Elena Rock.

Marino Rock, 8 feet above water, rises from a bed of sunken rocks which are nearly 800 yards southward of the western point of Platania Bay, on the south coast of Skiathos; the rocks are steep-to, and between them and the shore the water is 5½ fathoms deep.

Cape Puda Shoal.—A shoal, with 2¼ fathoms on it, lies about ¼ mile southward of Cape Puda, and bears the name of that cape.

Agia Elena Rock, with 9 feet water on it and 5 fathoms between it and the coast of Skiathos, lies 1,800 yards 318° from Cape Puda, and may generally be seen by keeping a good lookout. Cape Promiri, the northwestern point of the Skiathos Channel, in range bearing 338°, with Cape Sepias leads westward of Agra Elena and Cape Puda Shoals.

Gurnais Shoal, 600 yards off Cape Gurnais (situated ¾ mile, northeastward of Agia Elena Point, the western point of Skiathos, has 3 fathoms water on it, and is steep-to. Cape Griva of Trikiri Peninsula, in range or just shut in with Arapi Point, 242°, leads northwestward of Gurnais Shoal.

Euryalus Rock, on the western side of the channel and about the same distance from the shore of the Magnesian Promontory, with 16 feet on it, lies 1,200 yards 180° from Cape Sepias.

The foregoing are the off-lying dangers; the rest of the coast line of Skiathos Island and the mainland shore of Skiathos Channel are skirted with scattered rocks, but they are close in and do not impede navigation.

Directions.—When entering Skiathos Channel from the southeastward give Cape Puda a berth of about ¾ mile, and steer 338° with Cape Promiri in range or a little shut in with Cape Sepias until the old town of Skiathos, at the northern extremity of the island, is open of the western side of Skiathos, then keep in mid-channel.

From Trikiri Channel, and near Arapi Point, keep within ½ mile of the main coast until the southern end of Zogria is nearly in range with Cape Puda, bearing 107°, then steer as convenient.

If from the northward, and bound outside Eubœa, keep in mid-channel until the southern extremity of Zogria is just open of Cape Puda, 107°, then steer about 152° 30′; if bound for Trikiri Channel,

Digitized by Google

the mainland should be kept aboard or within the distance of about ½ mile, to lead northwestward of Lephtari Rock.

Skopelos Island, with a population of about 5,000, is 10½ miles in length in a northwest and southeast direction, rather less than 5 miles in extreme breadth, and tapers toward its northwest end. It is high, Mount Delphi, near the center, being 2,150 feet above the sea. The island is fertile and well cultivated, producing oil, grapes, citrons, and other fruits. A quantity of light red wine is exported in vessels belonging to the island to Constantinople and ports in the Black Sea.

There are no good ports in the island, although during the summer months vessels lie off the town in Skopelos Bay (sometimes called Agnontias Harbor), on the northeastern side of the island, exposed to the winds from that quarter, but which are said not to blow home at that period. The best berth is under the cliffs in the northwestern part of the bay with the starboard anchor in from 7 to 10 fathoms and a hawser fast to the rocks at the foot of the cliffs. Vessels should not anchor here during winter unless in cases of necessity, as when northeast winds do blow they send in a heavy short sea. In the inner part of the bay are the ruins of an ancient mole, but it affords no shelter.

Skopelos, the capital town of the island, with a population of about 3,800, stands on a rocky projection and presents an imposing appearance from the sea. To the southward of the town is a fertile plain surrounded by a semicircle of wooded hills. The northwestern part of the island is called Glossa, from its resemblance to the shape of a tongue, and contains four villages, the largest being Platani.

Communication.—In addition to the telegraph to all parts of the world, there is steamer communication with the Piræus, Volo, and other ports.

Supplies.—Refreshments to a limited extent may be procured, but no water without much difficulty, and then in small quantities.

Staphilis Bay, on the southeastern side of the island, has anchorage for coasters during northerly winds. Staphilis Point, on the eastern side, is of a reddish color and at a distance appears like a detached rock. A small supply of water may be procured from a fountain. A road leads to the town of Skopelos through a well-cultivated valley, and the journey takes one hour.

Port Panormo and Agonia Bay, both on the southwestern side of Skopelos Island, can be entered by small craft, but the water is deep for anchoring. There is a small creek on the southern side of Port Panormo, with 10 fathoms water at the entrance, but within it is shallow and rocky.

At the head of Agonia Bay is a small nook where vessels perform quarantine; they moor head and stern. There is a small well of water,

Digitized by Google

which has always 5 or 6 feet in it, and it is said that it never dries. From here to the town of Skopelos is 1½ hours' walk.

Bank.—A patch with 6 fathoms on it lies in the middle of the entrance to Agonia Bay; it has deep water round it.

Klima—Anchorage.—There is good anchorage in about 7 fathoms water, sand and weed, about 700 yards from the shore off the village of Klima, on the west coast of Skopelos and 3 miles from Guruni Head, the northwestern extremity, sheltered from all easterly winds. As north and northeasterly winds prevail during summer, this anchorage is available during that period.

Water may be obtained at the rate of about 1½ tons an hour from a small stream northward of Klima. Boats can lie within twice their length off the beach; the water is about 30 yards within; an engine or a hand pump may be used or the water baled into a hose. It will be well to trace the stream up, to see that washing or other impurities do not affect the water.

Skopelos Channel.—This channel, between Skopelos and Skiathos Islands, is free from danger by keeping midway between the islets on either side.

Light.—A fixed and flashing white light is exhibited, at an elevation of 223 feet, from a masonry tower, 47 feet high, on Guruni Head; it is visible 20 miles. (See Light List.)

Dasa Islet, 1 mile southeast of Kasida and 700 yards from the shore, is 100 feet high, conical, and wooded to its summit. Off its southwestward side is the little islet or rock, Strongylo. The water between the two islets and between Dasa and the shore is deep, but sailing vessels especially should avoid taking these passages on account of calms, strong and uncertain currents, and impossibility of anchorage.

A rock with a depth of 4 feet over it is situated about 80 yards off the southern extremity of Strongylo.

From Dasa Islet round Cape Muti and the southern part of Skopelos there are no dangers.

Kasida and Plero.—At 1½ miles southeastward of Praximada are the two little islets of Ksaida and Plero; Kasida has a shoal on its northern side, with 1 fathom water on it. Plero is 700 yards inshore from Kasida, and about ½ mile 327° from Plero is a 5½-fathom patch.

Praximada, the most northern of the islets on the Skopelos side, is small and barren, with deep water all around; the islet lies 1½ miles from the nearest point and 3.3 miles 180° from Guruni Head Lighthouse.

Bank.—At about ½ mile 310° from Praximada is a rocky patch with 5½ fathoms on it and 13 fathoms close-to; in a vessel of heavy draft it should be avoided.

Digitized by Google

Khelidromi (Halonisos) Channel.—Teleio Point, the southwestern extremity of Khelidromi Island, is distant 2 miles from Gurto Point, the eastern extremity of Skopelos. Between the two islands are the islets of St. Georgio and Mikro, narrowing the passage to 1,400 yards, and rendering it difficult for vessels to pass without a fair wind or steam power. St. Georgio, the larger of the two islets, is next to Skopelos, and from it a shoal with 9 feet water on it extends westward about 700 yards, leaving between it and Skopelos a narrow but clear passage; the shoal will generally be seen. Vessels taking this passage should keep the Skopelos shore aboard.

The passage between Mikro Islet (nearly 400 yards 40° from St. Georgio), and Khelidromi Island is 1,400 yards wide, deep and clear. The western face of Khelidromi is 1 mile north and south, and the shore is the base of Mount Khilia, which rises 1,000 feet immediately over the sea.

Currents.—The currents run strong in both channels and are much influenced by the winds.

Khelidromi (Halonisos) Island (the ancient *Ikos*) is 10½ miles in length northeast and southwest, with an average breadth of 1¾ miles, and is 1,590 feet high. It is generally barren and uncultivated, and no water can be obtained. The only village is on a sharp peak at the southwestern end of the island, near the sea. Some Venetian ruins of a fort attest that it was once of sufficient consequence to be defended, but the population of about 600 are among the poorest in the archipelago. The island abounds in rabbits and there is a plentiful supply of fish.

The site of the ancient town is at Kokino Kastro, on the southeast coast, so called from the deep red color of the promontory on which it stood, and by which now the entrance to the little port may be known. Very faint vestiges, however, remain, as the facility with which the stones of the old town could be removed rendered it much easier to carry away the stones already prepared than to quarry others.

Many ancient tombs are on a gentle hill at the back of the site of the town. The burial ground is nearly covered with a thick growth of fir trees of a vivid green, which, contrasted with the bright red cliffs and earth, renders the surrounding scenery attractive.

During the survey of this island by the British naval vessel Bonetta, in 1847, some silver and bronze coins of Alexander and Philip and many vases, amphoræ, and sepulchral lamps were found.

Anchorages.—There is no harbor, properly speaking, in the island, though there are one or two limited anchorages with northerly winds, etc., at Kokino Kastro and off a low sandy point on the southeast side of Khelidromi, 1½ miles southwestward of Aspro Point, the northern extremity of Peristeri Island. A mile west-southwest from

Digitized by Google

Kokino Kastro is a small bay having 9 and 10 fathoms water in the center and a small patch of 5 fathoms in the entrance; a vessel might lie here during a northerly wind.

Port Eiraka.—At the northeastern end of Khelidromi is a narrow creek about ½ mile deep, with 8 fathoms water and no dangers, named Port Eiraka; it is not utilized, and there is no fresh water, but it might be of use as a port of refuge for small craft.

Red and Moro Islets.—At 1½ miles eastward from Port Eiraka and near Gregali Point, the northeastern extremity of the island, are the two little islets, Red and Moro; the latter is about ½ mile from Gregali Point, and between it and Red Islet the water is deep.

The northwestern side of Khelidromi Island is composed of steep precipices, and the most elevated part of the island is 1,590 feet high a little within the northwestern coast and about 3 miles from Eiraka Point, its northern extremity. There are one or two bays, with two little islets, in the southern part of this side of the island, but nowhere along its whole length is there any anchorage.

Peristeri Island, 4½ miles in length and 817 feet high, has an irregular coast line and a large bay on its western side, which nearly divides it into two parts, the southern portion of the island being the larger; the northern part is narrow. At the head of this bay is a small nook, named Port Vasiliko, where small vessels can anchor. There is a small inlet at the southern end of the island, fit only for boats.

The island is barren, uncultivated, and has no water.

Peristeri Island lies nearly parallel to Khelidromi, from which its southwestern end is separated by a deep passage ½ mile wide and its northern end by a passage about 400 yards wide. Within the extremities of the island the area opens out, and from the shore of Khelidromi to the head of Port Vasiliko the distance is 2 miles, but except at Port Vasiliko and off the sandy point of Khelidromi, 1½ miles southwestward from Aspro Point, previously mentioned, the water is too deep for anchoring.

The entrances are quite clear; bound from the northward or eastward the northern entrance may be recognized by Aspro Point, which is low and white; vessels keeping in mid-channel may steer in without danger.

Likorima Island, about ¾ mile in length north and south, lies 1,200 yards eastward of the northern end of Peristeri, and in mid-channel between them there are from 54 to 80 fathoms water.

Adelphi Islands.—Lying nearly parallel to and southeastward of the south end of Khelidromi are the Adelphi Islands, extending in a northeast and southwest direction 5 miles. The large Adelphi is 1 mile in length, cliffy on its eastern side, 520 feet high, and clear of danger.

Digitized by Google

Adelphi Pulo is close to the northeastern side of the large Adelphi, the passage between being very narrow; a large rock lies off its northern end.

Cambrian Rock, the northern of the group, is only a little above water, with 3 fathoms close to it on the north and south; it lies with the peak of the large Adelphi bearing 203° and is distant ¾ mile from the rock at the northern end of Adelphi Pulo, with a clear passage between.

Palir and Gadaro.—The two southernmost islets or rocks of the Adelphi group, small and low, lie 208°, 2½ and 2.9 miles, respectively, from the peak of the large Adelphi Island; they rise from shallow rocky ground which extends north and south from each islet. At about 700 yards westward of the space between the two is a rocky shoal with 1½ fathoms water on it. The sea at times breaks heavily over these dangers. Between Palir and the large Adelphi there is no danger, and the passage is nearly 2 miles wide.

Skantzura Islands.—This group, extending 4 miles in a general northeast by north and southwest by south direction, lies southeastward of the Adelphi Islands and consists of Skantzura and five or six small islets or rocks. Skantzura is 3 miles in length north and south, with an irregular coast line, but no anchorage. A monastery stands on an elevation about one-third from its northern end. Off the northwest face of the island are three small islets, with shallow water extending a short distance northward; between them and Skantzura is a deep channel ¼ mile wide.

Strongylo Islet.—A small round islet called Strongylo lies ¾ mile westward of the central part of the island, and to the southward near the shore is the larger islet of Parausa.

Skandilion.—Southwestward of Skantzura are the two islets of Skandilion, the smaller to the northward; the shallow water which surrounds them extends ½ mile to the northward, and they are separated from the southern extremity of Skantzura by a deep passage 1,200 yards wide.

Koraka.—At nearly 1 mile 225° from Skandilion is Koraka, the southernmost islet of the Skantzura group; the passage midway between is clear and deep.

Rock.—Southeastward of Koraka, distant ½ mile, is a rocky shoal with only 1½ fathoms water on it. Vessels passing southward of the Skantzura group should give this danger a wide berth; it will generally be recognized by the heavy breakers over it.

Pelago Island is 4½ miles in length north and south, about 2½ miles in breadth, mountainous, being 1,040 feet high, uncultivated, and without water excepting in the rainy season, and then only in small quantities. A few years ago the only inhabitants were three

Digitized by Google

monks who resided on the northeast side of the island, with a few goats.

On its southwest side is the island of Pelerissa, at the entrance of a deep bay, but there is no safe anchorage except inside a small yellow islet in the northern corner of the bay east-northeastward of Pelerissa Island. The anchorage, being very limited, is only fit for small vessels, and the anchor should be ready to let go in an instant; the western entrance is the best.

In steering for this anchorage a deep bight or bay with a small plain at the head of it will be seen on the starboard hand and it would appear to a stranger as a fit place to anchor, but the bottom is treacherous and not to be trusted; the bay should not be resorted to except in case of necessity.

Pelago Channel.—The passage between Khelidromi and Pelago Islands is clear, deep, and 3 miles wide between Moro Islet and Panagia Point, the southern point of the bay just mentioned.

Port Planedhi, on the northeast side of Pelago Island, is nearly a lake, having 5 to 9 fathoms water, mud bottom, with two arms, one to the southwest, the other to the southeast. The entrance is only 90 yards across at the narrowest part, and 3½ fathoms is the least depth of water. It can only be entered by a sailing vessel with a fair wind. A heavy swell sets into the outer part of the entrance during northerly winds, but in the port the water is always smooth and a vessel could refit or heave down; at one time it was much resorted to by pirates. A few goats may be obtained, but no water.

Iura Island is 4 miles in length north and south, a little more than 1 mile in breadth, and its northern end tapers to a point. It has neither harbor nor roadstead, is uninhabited and almost inaccessible. Large numbers of wild goats fatten well on the scanty herbage which clothes the sides of the precipitous hills of which the island is composed.

At about 1¼ miles 79° from the northern extremity of Iura is a rocky bank having from 10 to 15 fathoms water on it.

Iura Channel.—The three islets named Prasson, Kubi, and Papu, eastward of Kento Point, the northeastern extremity of Pelago, are steep-to. The nearest point of Iura is distant from Pelago nearly 2 miles, and the channel is deep on either side of the islets.

Current.—The currents in the channel generally run according to the direction and force of the wind.

Piperi Island, bearing about east-southeastward from the center of Iura and distant 6 miles, is 2¼ miles in length north and south and its average breadth is less than 1 mile. It is encompassed by inacces-

Digitized by Google

sible precipices, has deep water all round, and possesses no shelter even for a boat. Between Piperi and Iura there are no dangers.

Psathura Island, the most northern of the Skopelos group, is 1 mile in length north and south and only a few feet above the sea. It has a small well of water near its southern end and some remains of ancient fortifications at its northern extremity. Its western side is steep-to, but its eastern side is bordered by a shoal to the distance of about 800 yards, which continues round the southern end of the island; it is resorted to by fishermen.

Light.—On Psathura Island and 140 yards from its northern extremity is a cylindrical masonry tower, 84 feet high, with dwelling attached, from which is shown, at an elevation of 129 feet, a fixed white light, visible 18 miles, except when obscured by the islands southward of it. (See Light List.)

Muia.—The little islet of Muia lies about ½ mile southward of Psathura, and the ground between them is foul, rocky, and uneven so that although the depth midway is from 3 to 7 fathoms vessels should not pass through. Muia is surrounded by rocky shallow ground, and at 700 yards 234° from it is a rock with less than 1 fathom water on it. The passage between this rock and the north point of Iura is 2½ miles wide, deep and clear.

Caution.—The current with northerly winds and calms sets strongly toward the Psathura Islets and has been the cause of many disastrous wrecks.

Venus Bank, with a depth of 44 fathoms over it and situated in latitude 39° 42′ north, longitude 24° 32′ 35″ east, was reported by the British naval vessel *Venus* in 1907.

Gulf of Saloniki.—From the Skopelos or Thessalian Islands the Gulf of Saloniki extends in a general north-northwest direction about 86 miles and then northeastward 10 miles farther to the town which gives its name to the gulf. The country on the western side of the gulf exhibits a magnificent range of mountains, which includes Mount Pelion, 5,316 feet high, rising over the head of the Gulf of Volo; Mount Ossa, 6,458 feet; and farther northwestward, Mount Olympus, which reaches 9,754 feet above the sea. On the eastern side of the gulf the land is also mountainous, though of less elevation than the summits on the western side.

The water throughout the gulf is deep, except within about 20 miles of the town, where there are anchoring depths in every part.

There are no off-lying dangers, but several low projecting points, as well as the low shore on the northern side of the head of the gulf, require caution in passing.

Current.—A strong current has been observed setting out of the gulf in March and April, probably owing to the melting of the snow and the freshets from the river.

Digitized by Google

Coast.—From Cape Promiri, in Thessaly, the shore trends north-northwesterly nearly 20 miles to Cape Pori, a rugged and slightly salient point with a rock close to its base called by the same name; the coast between is nearly straight, backed by highland, and all along clear of danger. At nearly 3 miles southeastward of Cape Pori is a beach and the village of Khorephto.

About 1 mile back from Khorephto is the village of Zagora, a telegraph station.

Mount Pelion rises majestically 4 miles southwestward of the cape in a broad and rounded outline; when viewed from the southward it shows two summits at some distance from each other, the depression between them being so slight as to give it the appearance of table-land.

Between Cape Pori and Cape Kissobo, 21 miles further northwest, the coast forming a slight bend is high and steep-to. Cape Kissobo is a prominent lofty headland; Mount Ossa, 8 miles westward of the cape, is steep, terminating in a cone. At 8 miles northwestward of Cape Kissobo is the entrance to Salambria River; the coast between is high and rocky and rises abruptly from the sea, and about midway between is the village of Karitza, about 500 feet above the sea, which shows conspicuously on the face of the steep mountain.

At about 2 miles southeastward from the entrance to Salambria River the rocky coast terminates in a bluff point and the mountain range falls a little back, bordered by a narrow belt of lowland with a sandy beach, which continues to Leftoro-khori Cliffs, 9 miles from the entrance to Saloniki Bay.

Tzai Agzi—Anchorage.—In the small and shallow bay ½ mile northwestward of the bluff point just mentioned is the little village of Tzai Agzi, containing about 50 houses, and close to a stony beach. The anchorage off the village is good during fine weather, and small vessels that frequent the place, anchor in 7 fathoms, about 700 yards from the beach. There are 10 fathoms water, sand and mud, about 1,400 yards from the shore, with Cape Kissobo in range with the bluff point southeastward of the village, and the center of the village bearing about 220°, the soundings thence decrease gradually to the shore.

Telegraph.—The village of Tzai Agzi is a telegraph station.

Salambria River (ancient *Peneus*) reaches the sea at this part of the Gulf of Saloniki through the celebrated Vale of Tempe, a narrow rocky defile 5 miles in length between the mountains of Olympus and Ossa, and where there is often only room for a traveler and the river to run side by side. The Salambria drains nearly the whole of Lhessaly and its course is about 110 miles long.

Anchorage will be found off the skala, near the mouth of the Salambria, in 9 or 10 fathoms, mud. Water may be obtained from

Digitized by Google

the skala. The seine can be hauled near the mouth of the river, and soles, ray, and mullet caught. In the river the stream is too strong for the seine, as it sweeps the net and boats to sea.

Light.—A fixed red light, visible 5½ miles is established at Tzai Agzi anchorage, southward of the Salambria (ancient *Peneus*) River mouth.

The light is exhibited 31 feet above the sea from a red iron hut 19½ feet in height erected on a masonry base.

Platamona Point and Shoal.—About 3 miles northward of Salambria River is Platamona Point, low, and surrounded by shallow water, which extends nearly 1 mile from the shore; at the extremity of the shoal there is only 4 fathoms. Vessels should give the point a berth of 1½ miles in passing or keep the highland of Cape Pori open eastward of Cape Kissobo, bearing 149°, which will clear the shoal.

The town and fort of Platamona, 6 miles 298° from Platamona Point, consists of a large and irregular group of buildings surrounded by a wall standing upon a rocky height overhanging the sea; a good mark for this part of the coast. A small garrison is maintained here. A stream runs into the sea on its south side.

Caution.—North and east of Platamona Point the surveys on which H. O. Chart No. 4128 is founded are imperfect.

Coast.—Atherida Point is about 25 miles north from Platamona Point; the coast between at the base of Mount Olympus forms a bend 6½ miles deep and may be approached to a moderate distance, there being no off-lying dangers. The skala of Katarina is 8¼ miles southward of Atherida Point, but at times the surf breaks heavily on the beach, and then there is no landing. The town of Katarina stands in a narrow plain between Olympus and the sea, and contains about 300 houses, which are surrounded with trees.

Mount Olympus.—The summit of this majestic mountain, which is 9,754 feet high, shows a wide surface of bare light-colored rock, capped with snow during the greater portion of the year. The broad side of the mountain when seen from the eastward presents a series of abrupt precipices of great height, broken at intervals by deep ravines, richly clothed with forest trees.

Atherida Point is low and projecting, and, with the exception of a rock close-to, has no danger off it. Between it and Panomi Point, opposite, the gulf narrows to a width of 10½ miles. From Atherida Point the western shore of the gulf with beach and cliff trends in a general 332° direction 6.7 miles to the skala of Leftoro-khori, where there is good landing and anchorage. The village of Leftoro-khori is on an eminence 1½ miles from the sea.

Caution.—The water off the skala is reported to be much shoaler than shown on the chart. In 1895 the British naval vessel *Sanspareil*

Digitized by Google

anchored in 7½ fathoms, with the skala bearing 265°, 2.7 miles, whence the soundings decreased gradually to the shore.

Vistritza River (ancient *Haliacmon*).—From the skala of Leftorokhori, at the termination of the cliffy coast, the northwestern shore of the Gulf of Saloniki trends northeastward 2½ miles to the principal mouth of the Vistritza River and Khoma fishery; the shallow banks at the outlets of this river have extended a considerable distance in a southeasterly direction since the survey of 1850.

Vardar River (ancient *Axius*) rises on the eastern slope of the Chardagh, on the frontiers of Albania and Macedonia, and is joined by several streams in its course to the sea, which is about 160 miles long. The delta forms a low point or spit, the southeast extremity of which bears approximately 85°, 7 miles from Khoma fishery, Vistritza River, the low broken shore between these places receding northward about 1½ miles from the line joining them. The shoal water off the mouth of Vardar River and the lightvessel are alluded to in describing Saloniki Bay. Before this is done the eastern side of the gulf will be described.

Kassandra Point (ancient *Posidium*, on the eastern side of the entrance to the Gulf of Saloniki, is a long low point projecting to the southwest and when first seen appears like an island. From the point eastward the land rises to the height of 1,078 feet and terminates in Cape Paliuri, the western entrance point of the Gulf of Kassandra, distant 18 miles; the cape is low, as well as the land for some distance westward of it. From Cape Paliuri the highland of Sithonia Peninsula, separating the Gulfs of Kassandra and Monte Santo, appears to the eastward, and beyond it the elevated cone of Mount Athos.

Light.—At 1,400 yards within the extremity of Kassandra Point is a white stone tower from which is exhibited, at an elevation of 72 feet above the sea, a flashing white light, visible 13 miles. (See Light List.)

Anchorage.—Anchorage may be obtained either northwestward or southeastward of Kassandra Point, according to the wind. At about 1½ miles eastward of the point, abreast a valley and 1,200 yards from the shore, there are 13 fathoms water, fine sand and shells. From this position Kassandra Lighthouse bears 28° and a small hut near a beach at the entrance to the valley 17°. The water shoals quickly to a depth of 3 fathoms, sand and weeds, at 400 yards from the shore. This anchorage affords shelter from northwest, around by north to northeast.

The British naval vessel *Swiftsure*, in March, 1877, anchored in 12 fathoms water, mud bottom, at about 1½ miles northward of the point. The lighthouse bore 197° and the southernmost of four mills in the

Digitized by Google

valley 80°. On sounding around the vessel, the bottom was found uneven, shoaling suddenly to 4½ fathoms at 350 yards inside the vessel. The stern swung from 20 fathoms into 5½ fathoms.

Eastern shore of the gulf.—When proceeding up the Gulf of Saloniki, there are no isolated off-lying dangers; the shore between Kassandra and Panomi Points, a distance of 33 miles, forms a bend a little more than 9 miles deep near the low Isthmus of Potidæa. The narrowest part of this isthmus, less than 1,400 yards broad, is 14½ miles northward from Kassandra Point. The central part of the shore between the point and the isthmus is bordered by shoal water; the coast from the isthmus to Panomi is also fringed by shoal water, which, under the depth of 5 fathoms, extends off an average distance of ½ mile, and behind it is high mountainous land.

Panomi Point is very low, projects from a plain, and is surrounded by a rocky shoal which extends to the southwestward about ¾ mile from the lighthouse and requires great caution in passing. Anchorage will be found on either side of the point, and there is a village on the plain. This point, with Atherida Point on the opposite shore, narrows the gulf to 10½ miles.

Light.—At 394 yards within the extremity of Panomi Point is a mast on a white house, from which is exhibited, at an elevation of about 52 feet above the sea, two fixed vertical white lights, visible 10 miles. (See Light List.)

Cape Kara, with Vardar Spit, 2.4 miles westward of it, form the entrance points of Saloniki Bay. This cape, on which there is a large earthwork fort and lighthouse, is a cliffy bluff of table-land, 70 to 100 feet high, rising from the low shore which terminates in Tuzla Point, a low spit of dark sand almost level with the water, which is difficult to distinguish excepting when northward or southward of it; about 1.7 miles on the south, within the sandy shore between the cape and Tuzla Point, are salt pans, 1 mile in extent northward and southward. Tuzla Point bears 329° nearly 7 miles from Panomi Point, the shore between forming two bays 1½ miles deep, fringed with a shoal bank for a distance of about 700 yards. From Tuzla Point the shore northward around Cape Kara is bordered by shallow water, which from the latter extends westward nearly ¾ mile before the depth of 5 fathoms is reached.

Vespasian Shoal, on the edge of this shallow water, composed of and and loose stones, has 14 feet water on it, with 20 to 24 feet close to it and 17 feet between it and the shore, and is situated about 1,350 yards 225° from Cape Kara Lighthouse.

Caution.—As many vessels have grounded on the shallow ground surrounding Cape Kara, great attention should be given to the following directions: Vessels entering or leaving Saloniki Bay should not round the cape or approach the coast between it and Tuzla Point

Digitized by Google

within a distance of 1 mile, nor stand into less than 10 fathoms water.

Light.—A fixed white and red light is exhibited, at an elevation of 85 feet, from a white stone tower on Cape Kara; visible 10 miles in the white sector and 6 miles in the red. The white light in sight clears Tuzla Point, but the foregoing precaution must be taken to keep westward of the shallow water surrounding the cape.

The land at the back of the lighthouse is high, with scattered trees.

(For sectors, see Light List and Chart.)

In navigating by this light mariners should be guided by the bearings rather than by the limits of the sectors.

Saloniki Bay from its entrance to the town trends northeast 10½ miles with an extreme breadth of 6 miles, and has depths over muddy bottom varying from 16 to 7 fathoms.

From Cape Kara the broken cliffy land trends eastward about 4 miles, when a low shore continues around a deep bight to within 1½ miles of Mikra Point.

Mikra Point, cliffy, with a battery on it, should not be approached too closely, as depths under 5 fathoms extend nearly ½ mile from it. Near the shore at 1.2 miles to the northeastward of Mikra Point are a mill and chimney, which are very conspicuous on a clear night.

From Mikra Point the eastern low shore continues in a north-northeasterly direction for 2¾ miles, with gardens and vineyards to the south corner of the town of Saloniki. Here is a high circular tower known as South Bastion, making a conspicuous mark to vessels approaching the town and for anchoring. Close to this low shore and 1 mile from South Bastion are two chimneys, east-northeast and west-southwest 90 yards from each other, the eastern one being some 20 feet the taller.

Vardar Bank Buoy.—A buoy, painted in black and white bands, is moored about ½ mile off Vardar Point.

There are 10 fathoms water, 200 yards eastward of the buoy, and 400 yards 310° from the buoy there is only 1 fathom.

Northwestern shore.—From the end of Vardar Spit the low, marshy, broken-up shore of Saloniki Bay trends in a northerly direction for 3 miles, and then in a general northeast direction for 10 miles to the western side of the town. The shore is cut up by numerous inlets and lagoons, the outlets of several streams which form extensive fisheries. At times the muddy water from the Vardar River and outlets of the lagoons reach nearly over to Cape Kara; these features and the almost constant mirage over the low irregular shore have led to many accidents.

Naziki Bank.—Extensive flats front this shore, the most dangerous being Naziki Bank, the outer edge of which, with depth of 5 fathoms, bears 45°, 4.1 miles from Vardar Bank lightvessel.

Digitized by Google

Between Naziki Bank and the town two other extensive banks stretch off, the outer ends with depths of 2 fathoms bearing, respectively, 228°, 3½ miles and 248°, 2 miles from the southeastern end of the breakwater. Between the northeastern of these three banks and the town the 5-fathom curve approaches the shore to an average distance of 600 yards.

Caution.—As great changes in depths are reported in all parts of Saloniki Bay, great caution must be observed in approaching the edges of the shore banks, especially those on the northwestern side

In order to avoid the shoal water extending from the northwestern shore of the bay, vessels of deep draft should keep eastward of a line joining Cape Kara and the South Bastion, Saloniki, until abreast of Mikra Point.

Harbor.—A harbor with a depth of 28 feet maintained by dredging is formed by a quay 437 yards long, with a mole 218 yards long at each end and an island breakwater 617 yards long facing it.

The entrance to the harbor has a depth of 26 feet and is prohibited at night.

Lights.—At each end of the breakwater two fixed red unwatched lantern lights, placed vertically, are exhibited; they are unreliable and it is reported that sometimes only one light is shown at each end

Signals.—A green flag is hoisted at the outer angle at the east mole when entry to the harbor is permitted and a red flag when it is prohibited.

Chimneys.—About 1,400 yards westward of the west mole and close to the shore are situated two conspicuous chimneys about 100 yards apart; the western and taller is close to the east end of Olympus Brewery, which extends westward to within about 100 yards of the slaughterhouse.

Shoal.—A shoal of 4 fathoms, having irregular soundings of from 5½ to 7 fathoms at a distance of 400 yards round it, lies ½ mile 256° from the southeastern end of the breakwater.

The Anchorage is anywhere off the town clear of the above shoal in from 7 to 9 fathoms, good holding ground, but exposed to southwest winds. With these winds a sea soon gets up and landing is then attended with difficulty except inside the harbor. Winds from the northwest blow with great violence. The usual anchorage for naval vessels is off the South Bastion, and abreast the British consul general's house, in 8 or 9 fathoms.

When leaving the anchorage, and obliged to beat down the bay, bearings of South Bastion and Mikra Point are capital marks to check the vessel's position in standing toward the northwest side of the bay until well down to Cape Kara, bearing in mind the report that the low broken shore on that side and the soundings off it have altered very much of late years.

Digitized by Google

Quays.—The length of the main quay is 435 yards, with a depth alongside of 16 to 19 feet. The arms are each 220 yards in length, with a depth of 25 feet alongside the eastern one and at its outer end, and of 13 to 19 feet alongside the western one. At a distance of 20 feet out from the quays the depths are about 5 feet greater than those alongside.

There is accommodation for mooring alongside the quays, and vessels of not more than 18 feet draft can lie alongside the breakwater except at its eastern end. There are mooring rings on the breakwater, so that vessels can anchor off and secure their sterns to these rings. There are four traveling steam cranes, one of 15 tons capacity, one of 5 tons, and two of 2 tons.

At the quay fronting the town the depths are from 9 to 15 feet.

Piers.—The only loading piers in repair are the Railway pier northward of the harbor, and the Brickworks pier, nearly 1 mile southward of the town.

Wreck.—A wreck, with one mast and boat davits showing above water lies sunk (1912) at Saloniki about 430 yards 267° from the northwestern end of the detached breakwater. The wreck lies in a northwest and southeast direction and is marked at the center by a beacon with a square top mark.

Saloniki (ancient Thessalonika), on the acclivity of a steep hill at the northeastern extremity of the bay, is about 4 miles in circuit, and ascends from the sea in a somewhat triangular form, having high walls on the land sides and inclosing the citadel above, which has seven towers. The walls being whitewashed, make the town conspicuous from the sea, so that it is seen from a great distance; the architecture of the lower part of the walls is Cyclopean and Hellenic, while that of the upper part dates from the Middle Ages; the walls are built of brick, with ancient fragments intermixed. All the fortifications on the sea front have been taken down and a sea wall and quay built.

The citadel, called by the Turks "Seven Towers," is the old Acropolis, within which are the remains of some very antique pillars and of a triumphal arch erected in the time of Marcus Aurelius. Domes and minarets are numerous, and the town, being surrounded by plantations of cypress and other evergreens and shrubs, has an imposing appearance contrasting greatly with its indifference within. The customhouse, a fine large building, is at the northwestern end of the quay.

Population.—The population of Saloniki is about 174,000.

Consul.—The United States is represented by a consul, vice and deputy consul.

Trade.—The principal exports are skins, silk, flour, cattle, tobacco, maize, barley, oats, rye, wheat, manganese, opium, etc.; the princi-

Digitized by Google

pal imports are coffee, cotton, sugar, hardware, cotton and woollen goods.

Disease.—The city is subject to malaria, and the whole country at the head of the gulf is unhealthful.

Communication.—Frequent and regular steamer communication is kept up with Marseille, Venice, Constantinople, Smyrna, Volo, and other principal Mediterranean ports.

Railroads.—There is communication by rail with Monastir, Uskup, Nisch (for Vienna), Dedeagatch, Adrianople, Constantinople, Belgrade, etc.

Telegraph.—There is telegraphic communication with the archipelago and all parts of the world. A submarine cable is laid along the middle of the bay to Lemnos Island, the landing place and stone cablehouse being situated near the western pier and about 700 yards eastward of Olympus Brewery; vessels should avoid anchoring over it.

Supplies are plentiful and cheap, with the exception of fish, which, being farmed out and heavily taxed, is dear.

There is excellent shooting in the neighborhood, including pheasants, woodcocks, wild fowl, etc.

Coal.—About 21,000 tons of coal are imported annually, 7,000 tons being usually in stock. There is a depth of 26 feet alongside the quays. Coaling is performed by lighters carrying about 30 to 40 tons each, of which there are about 50.

Water.—The water in Saloniki Bay is not good for distilling, as it causes the evaporators constantly to prime. Excellent water can be obtained from hydrants on the quay; there is a water tank holding 20 tons for the supply of shipping.

Gulf of Kassandra.—Eastward of the entrance to the Gulf of Saloniki are three remarkable peninsulas, each projecting about 25 miles to the southeast, nearly parallel to each other, and embracing the Gulfs of Kassandra and Monte Santo. Of these peninsulas the southwestern, named Pallene or Kassandra, is the most fertile, the two others having in all ages been rugged and clothed with forests.

The Pallene Peninsula, united to the main on the north by the Isthmus of Potidæa (a narrow low neck), terminates in Cape Paliuri and forms the southwestern side of the Gulf of Kassandra. The village of Pinaka, formerly Pallene, from which the peninsula takes its name, is situated at the northern end of the peninsula and ½ mile southward of ancient Potidæa. A ruined rampart, with turrets, stretches from shore to shore, and is called the gate (porta) of Kassandra. Hellenic blocks of the wall which defended the once flourishing city of Potidæa are still to be seen.

Sithonia, the middle peninsula, is mountainous, the most elevated part which is near the center, being 2,596 feet high; the coast is

Digitized by Google

irregular with scattered rocks here and there, and deep water close-to. It terminates on the southward in Cape Drepano, a conical hill 889 feet high, and separates the Gulf of Kassandra from the Gulf of Monte Santo.

The Gulf of Kassandra, at the entrance between the two peninsulas, is about 5 miles in breadth, widens within to 12 miles, and extends in 26 miles to its head, where anchorage may be found, but elsewhere the water is generally too deep.

Current.—The British naval vessel *Edinburgh* while on her passage from Saloniki to Thaso Island in October, 1892, experienced southward of the entrances to the Gulfs of Kassandra and Monte Santo a westerly set of ½ knot per hour. When 1½ miles off Cape Laura, Akte Peninsula, a current to the southwest at the rate of 1½ knots per hour was observed.

Caution.—With the exception of the island of Lemnos, the surveys on which H. O. Chart No. 3,967 is founded are imperfect.

Kelpho Islet.—Seven and one-quarter miles 355° from Cape Nikolo (the northern point of the eastern extremity of the Pallene Peninsula) is the little islet of Kelpho, separated from the eastern shore of the Gulf of Kassandra by a passage 2¼ miles wide and upward of 60 fathoms deep.

Cape Kastro—Rock southwestward.—A rock having a least depth of 1 fathom has been discovered about 1 mile southwestward of Cape Kastro, in (approximately) latitude 40° 10′ 08″ north, longitude 23° 42′ 00 east.

Caution.—Mariners are warned to exercise great caution when navigating in the vicinity. Considerably less water than charted is reported to exist between this rock and Cape Kastro.

Port Kupho.—This little port, on the eastern side of the entrance to the Gulf of Kassandra, extends in east-northeast ½ mile, and then north-northwest about the same distance to its head, where it is about 300 yards wide. The depths of water is from about 35 fathoms at the entrance to 5 fathoms at its head, sandy bottom. The entrance is between high bold land on either side, and 300 yards west-northwestward from the western entrance point is situated the islet of Praso, surrounded by rocks above and below water.

Immediately northeastward of the western entrance point is a bay nearly 400 yards deep. From this bay the shore trends eastward about 800 yards to another point whence the port runs northward. The latter point is foul for 67 yards and the point 600 yards eastward of it on the opposite shore is foul for 134 yards. There is nothing in the way in entering this little port but the shoals just mentioned, and its northern part is landlocked. The high cone of Mount Athos bearing 57°, seen over the lower land of the Sithonia Peninsula, leads to the entrance.

Digitized by Google

Should Mount Athos be in the clouds, there is a one-storied white-washed house (used as a barrack) standing on the eastern side of the port, which is seen as a white square spot for a considerable distance. This house bearing 62° 30′ leads also to the entrance of Port Kupho.

The Gulf of Monte Santo is very similar to the Gulf of Kassandra, but wider at the entrance. It is bounded on the southwest by the peninsula of Sithonia and on the northeast by that of Akte; the entrance between Skepe Reef on the west and the base of Mount Athos is about 13 miles wide, and thence the gulf runs in 26 miles to its head. The water is everywhere deep, and there are no off-lying dangers.

Skepe Reef.—At about 1,200 yards southward of Adolo Point, the southern entrance point of Port Sikia, a rocky ledge extends about 700 yards from the shore and forms a tongue to the southward parallel to the coast for ¾ mile. At about 400 yards from its northeastern shoulder is a large rock or islet; other rocks are uncovered, and elsewhere there are from 12 to less than 6 feet water on it. Within this rocky tongue, called Skepe Reef, there are 7 and 10 fathoms water, leading to a small cove. The reef skirts the most eastern part of the Sithonia Peninsula, and should be given a fair berth in passing.

Port Sikia, on the southwestern side of and near the entrance to the Gulf of Monte Santo, is 1¼ miles deep, having from 16 to 5 fathoms water, sandy bottom. Cape Sikia, the northern point of entrance, is foul, and southwestward of it is a little islet called Apastro, with sunken rocks extending 200 yards southeastward. The passage into the port, between these rocks and Adolo Point, is clear and about 1,400 yards wide. The shore at the head of the port is a beach, and 2.3 miles westward from the northern end of this beach is the village of Sikia (the ancient *Singus*), which gives its name to the bay.

Dangers.—Rikha Point, about 3 miles northward of Port Sikia, has a reef extending from it, and 2 miles farther northwestward is a little projection to the north, surrounded by an extensive shoal and called Shoal Point; a rock lies also at the foot of Trako Head, 3¼ miles northwestward of the latter point. These dangers should be given a wide berth in passing.

Port Dimitri.—On the southwestern side of the Gulf of Monte Santo and about 10½ miles from Rikha Point is the island of Dimitri, 1¾ miles in length north and south and ¾ mile in breadth, irregular in shape, with rocks extending about 200 yards from its southeastern point, the outer of which is above water.

Port Dimitri is formed between the island of that name and the low shore of a bay. The southern passage into the port is between the rock above water, just mentioned, extending from the south-

Digitized by Google

eastern point of the island and a little islet with sunken rocks on its east and west sides, lying nearly midway between it and the mainland shore.

In the channel between these rocks there are 14 fathoms of water, but immediately within it shoals to 4 fathoms; farther in there are depths of 5, 6, and 10 fathoms, which increase northward to 22 fathoms, and decrease again to 5 fathoms in the northern passage between the two islets lying between the northern end of Dimitri Island and the main shore. The depths in the southern part of the port are the most convenient for anchoring; here the widest part of the port is nearly ½ mile in breadth.

Rock.—A rock with a depth of 2¼ fathoms has been discovered in the southern entrance to Port Dimitri, about 230 yards 140° from the southeastern extremity of Dimitri Island and about 35 yards southeastward of the outer rock above water.

Coast.—The shore of the gulf at its head from Port Dimitri to Problaka Bay appears to be rugged and steep-to and to afford no anchorage.

Problaka Bay.—Mulari Island, in the northeastern corner of the Gulf of Monte Santo, is nearly 3¼ miles in length northwest and southeast; its northwestern side is 1¾ miles long, whence it tapers to the southeast. Shallow patches, upon which there are two little islets, lie about 700 yards northward of the western end of the island. The western one is about 30 and the other about 18 feet high; a shoal with 2 fathoms water on it lies 600 yards northeastward of the latter and about the same distance from Mulari Island. A cluster of islets and rocks lie close off the southeastern extremity of the island, to which they are united and to each other by shallow, rocky ground.

These islets reach halfway to a slight projection of the main shore, on which there is a square tower called Pyrgo. From this point a bank under the depth of 3 fathoms extends westward 800 yards and southwestward 600 yards.

Mulari Island fronts the Isthmus of Xerxes on the northward, from which it is distant about 1 mile.

Shoal.—An isolated rock with 2½ fathoms water on it lies in the middle of the passage between Pyrgo Bank and the northeastern islet of Mulari. The rock bears 85°, 600 yards from the southern extremity of this islet. There is a narrow passage on either side of the rock and depth of from 3½ to 5 fathoms.

Cygnet Rock, a pinnacle with 1 fathom water on it and 5 to 7 fathoms at the distance of 30 to 40 yards around it, lies 800 yards, 279°, from the northern extremity of the northeastern islet.

The Isthmus of Xerxes, which unites the Akte Peninsula to the main, consists of level land and low hills, from which the land rises and forms a steep central ridge which runs southeastward. The site

Digitized by Google

of the Xerxes Canal is a hollow between natural banks, and several artificial mounds and remains of walls can be traced along it. Its length across the isthmus is about 1¼ miles; the hills on its western side range from 350 to 500 feet high and those immediately on the eastward to 170 feet.

Anchorage.—The shore on the southern side of the isthmus forms a slight curve between which and Mulari Island there is anchorage on a sandy bottom, but the water is deep. Large vessels should not anchor in less than 25 or 20 fathoms, at about 600 yards from the beach. The anchorage is northward of Fearless Point, the northeastern part of Mulari Island, and eastward of Spratt Point, a sandy projection at the western extremity of the bay.

Akte, or Monte Santo Peninsula.—The northeastern of the three peninsulas, the ancient *Akte*, is rugged, and intersected by numerous ravines; the land rises abruptly from the Isthmus of Xerxes to about 300 feet, and for the first 12 miles to the southeastward it is nearly level, about 600 feet high, and for the most part thickly wooded. It then becomes mountainous, the heights being 1,708 and 2,195 feet; on the northern slope of the latter elevation and at a nearly equal distance from the northeastern and southwestern coast, amidst vineyards and gardens, is the town of Karies, the capital of the peninsula. From the last-mentioned height a rugged broken country, with dark forests, extends southeastward to the foot of Mount Athos, an isolated cone of white limestone, which rises in solitary grandeur 6,349 feet above the sea.

Mount Athos, as well as the peninsula from which it rises, is now known throughout the Levant as the Holy Mountain or Monte Santo, from the number of monasteries and chapels which are scattered over it. These semifortified monasteries, of which there are about 20, of different degrees of magnitude and importance, with the farms attached to them, are spread over the whole peninsula. Most of them were founded during the Byzantine Empire, and some of them trace their origin to the Empress Helena, the mother of Constantine the Great. Each of the different nations belonging to the Greek Church has one or more monasteries of its own, and they are visited periodically by pilgrims from Russia, Servia, Bulgaria, Greece, Asia Minor, Constantinople, etc.

Russiko.—A monastery known as Saint Pantaleimon is situated on the southwestern side of the peninsula, nearly 10 miles from Cape Santo. It was founded for Russians in the twelfth century, but now the majority of the brethren are Greeks. The monastery itself is inclosed by a wall, which has only one gateway, but the workshops, storehouses, and dwelling houses surrounding it and between it and the water's edge give it the appearance of a town. It is increasing in size each year. The white walls of the monastery can be seen

Digitized by Google

a long way off. Below it is a small bay with a depth of 20 fathoms, at 80 fathoms from the north shore. In order to anchor in this depth, bring in range the northern end of the monastery (on the eastern side of the bay), the house with the attic on the hill above it, and a conical hill rather more elevated above the monastery than the others. On this range a steamer should proceed slowly, and as soon as the abrupt headland nearest the monastery pier begins to cover the house standing behind it the anchor should be let go. The conical hill is always easily distinguished.

The little bay is reported snug enough excepting in southerly winds; several small craft are usually at anchor in it, and among them the steam launch belonging to the monastery.

The inhabitants of the monastery say that strong northwest winds occur, though very seldom; during winter, however, northeast winds mostly prevail and are sometimes very violent.

Mooring buoys.—There are two white mooring buoys a little westward of the Russian Monastery, the outer one being placed in 32 fathoms of water a little over 285 yards from the shore. Vessels of 4,000 tons can use this buoy. The inner, a small white mooring buoy, for the use of sailing vessels, is moored off the Russian Monastery, in 18 fathoms, 100 yards from shore and 185 yards from the outer mooring buoy. These buoys were placed by the Russian Navigation Co. for their vessels to make fast to head and stern.

The Russian steamers call here fortnightly, both ways, on their passage between Odessa and Saloniki.

Daphni quarantine station.—Kastana Point, on the southwestern side of Akte Peninsula, is about 8 miles from Cape Santo and 2 miles southward from Russiko. About ½ mile northward of Kastana Point, is the quarantine station of Daphni, at which vessels with pilgrims to the various monasteries report. The doctor is not always present at the station, being frequently at Karies, 2 miles distant, but he is generally at Daphni when a vessel is expected.

Telegraph.—Daphni is a telegraph station.

Anchorage will be found in one or two other bays off the monasteries; the best on the northeastern side of the peninsula is Iberon Bay, 1½ miles eastward of Karies, in 9 fathoms, sand, with the tower of the monastery bearing 223°; also in Paida Bay, which is more sheltered, in 12 fathoms, mud, and good holding ground, though a small vessel might go farther in. Off some of the monasteries there is no anchorage, and to land goods or passengers a vessel must lie to. Many of these monasteries appear at a distance like little towns.

There is no anchorage around the base of Mount Athos, the water being too deep.

Digitized by Google

Mooring buoys.—The following mooring buoys are moored in the Bay of Daphni:

A buoy of large size for vessels of 4,000 tons and over, in 50 fathoms of water, northwestward of the landing mole at Daphni, 293 yards from the shore and in range with Kastana Point and Daphni Light.

A buoy of small size, for the use of small coasting steamers or sailing vessels, in 25 fathoms of water, northward of the landing mole, 110 yards from shore and 185 yards from the above buoy.

A buoy of medium size, for vessels of 2,000 tons or over, in 30 fathoms of water, westward of the landing mole at Daphni, 183 yards from the first-mentioned buoy and 140 yards from the shore.

Light.—A fixed red light, visible 6 miles, is established at Daphni.

The light is exhibited 52 feet above high water from an iron cabin 17 yards from the shore, with the Xero-potamos Monastery bearing 57°.

The light is obscured eastward of the bearing 8° by Kastana Point. (See Light List.)

Erissos Bay.—On the northern side of the Isthmus of Xerxes and about 3 miles eastward of its narrowest part a tongue of land projects 4 miles northward; its extremity is known as Cape Plati, and close to it are two large rocks or islets. On the western side of this tongue and a little more than 1 mile southward of the cape is a nearly circular bay about 600 yards in diameter, with from 4 to 8 fathoms water, named Plati Harbor; although the bottom, composed uniformly of mud and sand, is not good holding ground, the harbor is considered a safe port of refuge. Two sunken rocks lie off the southern point of entrance.

Cape Eleuthera, a steep rugged projection about 5¾ miles 321° from Cape Plati, has a small islet called by the same name and one or two rocks uncovered close to it, and everywhere deep water.

Between the two capes is the entrance to Erissos Bay, which is 5 miles deep and 10 miles in breadth northwest and southeast.

Ammos Point, 1¼ miles east-southeastward of Erissos, is surrounded by rocks to the distance of about 200 yards; 700 yards westward other rocks extend off about the same distance.

Erissos (ancient Acanthus), now a straggling village, is on the coast halfway between Mison and Ammos Points. The ruins of a fortress which surmounts the village are of medieval construction, but its foundations are Hellenic, as also are many masses of masonry around.

Mison Point, opposite the middle of the entrance to Erissos Bay, bears 214° from the eastern extremity of Eleuthera Islet.

Rock.—A rock with 2 feet water on it lies with its outer end bearing 341°, 1.8 miles from Mison Point and 1,200 yards offshore.

Digitized by Google

With this exception, there are no known off-lying dangers. The holding ground is said to be mud and sand.

Stratoni Bay is the name given to the northwest corner of Erissos Bay, where vessels have recently loaded manganese iron ore. The ore is mined at a place called Isboros, situated about 5 miles inland, where there is a telegraph station. The smelting is done at Stratoni, recognizable by its chimney, circular furnaces, and the dwellings of the workmen.

Stratoni is 4 miles westward of Eleuthera Island and 4½ miles northward from Mison Point. Vessels loading, head about east-northeast with one anchor to the northeast, in 8 fathoms, and the other to southeast, in 13 fathoms over sand and weed, the vessel's stern being made fast by a strong hawser to a large iron buoy, painted red, and moored in 5 fathoms. Thus moored, the vessel lies parallel to the shore and 300 yards from a short pier, from which the ore is carried to the vessel by means of lighters, each carrying about 10 tons. These lighters are hove backward and forward by the vessel's steam winch and by one on shore. The stevedore usually comes on board to berth the vessel.

A light railroad connects Stratoni with the mines situated on the southern slopes of the mountain about 5 miles inland. The pier has a depth of about 16 feet at its outer end.

Northeast gales throw in, at times, sufficient swell to prevent loading and compelling a vessel to take shelter in Plati Harbor, already described.

Water.—Fairly good well water can be had by means of casks, and, by several days' notice, a few sheep may be procured.

Pratique is obtained at Daphni, already alluded to. The usual customhouse and consular business is done at Saloniki, to which the mining engineer sends a messenger twice a week.

The Gulf of Ruphani, northward of Erissos Bay, is 12 miles wide at the entrance between Cape Eleuthera and Cape Deutheros on the northeast. From the line of these capes the gulf recedes northwestward 14 miles to the sandy beach at its head, which is backed by high land.

Libiadha Bay lies 7 miles northwestward of Cape Eleuthera. In front of the bay is the little islet of Kaphkana surrounded by shallow water and rocks uncovered on its western side. Between the islet and the bay there are 12 fathoms water, but rocks covered and uncovered extend off the northern point of Libiadha Bay, toward Kaphkana Islet, leaving, however, a 9-fathom channel between. Nearly midway between Cape Eleuthera and Kaphkana Islet and about ½ mile from the shore is an isolated rock or islet, only 3 feet high, and not easily seen from seaward, with only 5 fathoms southeastward of it.

Digitized by Google

Stavros Point, 4 miles northwestward of Kaphkana Islet, is bordered by shoal water, and about 2 miles westward of the point is the outlet of Bolbe Lake, which is about 5 miles inland.

Struma River or Kara-su.—A sandy shore, forming the head of the gulf, thence trends northeastward to the entrance of Struma River (ancient Strymon), and thence east-southeastward 8.3 miles to Cape Deutheros, the northeastern entrance point of the gulf, where the beach terminates. The elevated mountain Pilaf Tepe, 11 miles north-northeastward of the cape, rises 6,143 feet high.

The ruins of Amphipolis, with the remains of an aqueduct and traces of the Acropolis, are still in existence on the left bank of the Struma.

Near the mouth of the river is a customhouse, and a village called Chai Aghizi is situated near the landing place westward of the two lagoons.

There is anchorage off the river in 16 fathoms, mud, with a building at the entrance bearing about 6°. The sea is, at times, much discolored by the mud from the river. A surface current at the anchorage has been observed to run at the rate of 2½ miles an hour. Sailing vessels call here occasionally.

The best channel over the bar has a depth of about 4½ feet.

Water may be obtained at a short distance up the river.

Cape Deutheros.—Shoal water extends nearly ½ mile off Cape Deutheros, which must be given a wide berth in rounding.

Deuthero Cove (Leftere).—Cape Brasides, 15 miles east-northeastward of Cape Deutheros, is the termination of a tongue of land projecting eastward, and has a general depth of 7 fathoms close-to, but a ledge with 5 fathoms water on it extends outside this depth, 400 yards from the cape, in an 62° 30′ direction. On the hill, nearly 1,400 yards within the cape, is a tower. The entrance to Deuthero Cove, or Leftere, as it is called by both the Greek and Turkish inhabitants of the place, is ¾ mile wide between the northern extremity of Cape Brasides and the bluff point on the north. The cove within is nearly oval, 1.3 miles north and south and nearly 1 mile east and west, with from 12 to 5 fathoms water, affording a snug anchorage and plenty of room for several vessels.

The land at the head of the cove is cultivated, and just within the shore on the southwest, is a farm. The village of Deutheropolis, probably the ancient Æsyme, is about 1 mile inland from the southern part of the cove.

Deuthero Cove—Light.—An unwatched flashing white light is established on the northern side of the entrance to Deuthero Cove, 25 yards from the shore.

The light is exhibited, 53 feet above high water, from a white iron structure, 10 feet high, on a concrete base, and is visible seaward

Digitized by Google

8 miles. The light is obscured by the land northward of the bearing 264° and by Cape Brasides westward of the bearing 329°. (See Light List.)

Pier.—There is a small pier, about 100 yards in length, in the northeast corner of the cove, off which are two white mooring buoys.

Buoys.—Two large mooring buoys are moored in Deuthero Cove, northeastward of the anchorage.

One buoy is located 1.36 miles 16° and the other 1.28 miles 21° from the north corner of Chiftilik.

The buoys are 220 yards apart. Vessels should not anchor within 100 yards northeastward of these buoys.

Kisilad Islet.—At 1½ miles northward of the cove and separated from the bluff point by a distance of 1,400 yards is the islet of Kisilad; there are 19 fathoms water between the islet and point, but the shore of the bay northwestward of the islet is scattered with rocks.

Kavala Bay.—This bay is 7 miles northeastward of Deuthero Cove, and the lighthouse bears 304°, 13½ miles from Cape Ommanney, the northern point of Thaso Island. It is about 1 mile wide between the points of entrance and ½ mile deep, with from 12 to 6 fathoms water, sandy bottom.

The head of the bay is formed by two yellow sandy beaches, separated by a rocky point on which is situated a large yellow house, conspicuous from a long distance. In the eastern bight there is a conspicuous house standing close to the eastern extremity of the eastern yellow beach and a few private residences, while in the western bight the houses are fairly numerous and all of about the same size; the land is slightly cultivated.

The soundings are regular, and gradually decrease from a depth of 13 fathoms in the entrance to the shore, the bottom being of fine sand except near the projecting points, where it is rock.

Kavala town (ancient *Neapolis*) occupies a rocky promontory, the houses rising one above the other to the summit, on which is an ancient fortress; the whole is encircled by old walls still in fair preservation. The promontory is connected to the mainland by an isthmus, over which a fine Roman aqueduct conveys water from the hills to the inhabitants, but the supply is insufficient for their needs. The name of Philippi survives in that of Felibejik, a ruined Turkish hamlet situated on the border of a marsh southeastward of the site of Philippi. The principal remains of Phillippi are situated ¾ mile westward of Bereketli, a village 7 miles northeastward of Kavala.

Kavala, with a population of about 25,000, is a thriving town. There is a short mole and landing place; the sanitary condition is said to be bad.

Communication.—By the Austrian Lloyd's steamer company communication is maintained fortnightly with Trieste, Saloniki,

Digitized by Google

Constantinople, and the principal ports in the Aegean Sea. The Russian company's steamers call here fortnightly both ways on their passage between Odessa and Saloniki. One Greek and two Turkish lines of steamers also call weekly. Kavala is also a telegraph station.

Trade.—The principal article of export is tobacco; the chief articles of import being flour, maize, sugar, iron goods, cotton goods, sacking, and cotton yarns. The tobacco is grown in the neighborhood in large quantities and of a good quality.

Light.—A fixed white light is exhibited, at an elevation of 148 feet above the sea, from a white wooden framework on the walls of a castle on the eastern entrance point of the bay, and is visible 10 miles.

The best anchorage for a vessel of heavy draft is in 11 fathoms over black mud, with the house on the rocky point between the beaches bearing 324° and the lighthouse bearing 85°. Small coasting vessels anchor in a bight under the walls of the town on the eastern side of the bay. Strong southerly winds bring in a heavy sea and render the anchorage unsafe in summer until these winds subside.

A rock above water lies 350 yards 198° from the western point of entrance; another rock lies 150 yards southwestward of the lighthouse.

Coast.—From Kavala Bay a low sandy shore trends eastward about 5½ miles and then south-southeastward for 7 miles to Koan Point, the northern point of the western entrance to Thaso Strait. At the back of this latter part of the coast the land is low and swampy, with several lagoons, and during winter is frequently overflowed, so that communication between Kavala and Kalamuti is impeded. From Cape Brasides the coast is backed by a chain of mountains which run in a northeasterly direction to Mount Zanthe, 16 miles from the sea and 3,815 feet high.

Thaso is the most northern of the Aegean Islands and is somewhat circular in form, being 14 miles north and south and 12 miles east and west; it is mountainous, more particularly on the eastern side, where Mount Ipsario, the highest peak, is 3,428 feet above the sea. The island appears to be a mass of marble covered with trees, chiefly fir, and some small oaks, but none of any size. The produce consists mainly of maize or Indian corn, tobacco, and vegetables; sheep are small, but cattle large. In ancient times extensive gold mines are said to have been worked, and in the present day large quantities of calamine zinc ore are exported. Tin, iron, and copper are also reported to exist in the island. The population amounts to about 12,000, nearly all Greeks, dispersed in some 10 villages.

Telegraph.—A cable connects Thaso with the mainland at Koan Point and thence by land line with Kavala.

Digitized by Google

Thaso Strait is formed between Thaso Island and the low shore of the plain of the Nestus on the north, and in the narrowest part, between Cape Ommanney and Koan Point, is 3⅓ miles wide. Nearly in the middle of the strait is Thaso Pulo, an islet nearly 1 mile in length northwest and southeast, 355 feet high, and steep-to all around. There are no isolated off-lying dangers in the strait, the general depths being from 14 to 17 fathoms, sand or mud.

Current.—A current generally sets westward through Thaso Strait and also southward of Thaso Island; during southerly winds the stream from the Dardanelles, being diverted from its usual course and striking the Peninsula of Akte, is forced to the northeastward and eastward along the coast of Rumelia, when the current in the strait has been found setting eastward at the rate of ½ knot to 1½ knots an hour.

Panagia Road, on the northern side of Thaso Island, affords good anchorage in 9 or 10 fathoms, with Escombe Point, the southeastern extremity of Thaso Pulo, bearing 18°, and Wellings Point, the eastern point of the roadstead, 108°. A swell from the eastward often sets in, proportionally to the force of the wind.

There is a small artificial harbor near Wellings Point with a depth of 2 feet. There is also a pier at the town and another farther westward.

Panagia Island.—The island lies about 4½ miles 164° from Hamidieh, off the southern point of Thaso Island. It rises steeply, and is with difficulty accessible, the only landing place being in a small bay on the southern side of the island. An isolated rock, 25 feet high, is situated off the southeastern point. The island is now uninhabited, but birds and rabbits live there, and the bay is rich in fish.

Wellings Point has shoal water extending 100 yards from it, and a bank, known as Bullmore Patch, lies with its shallowest depth of 7 fathoms 800 yards 24° from the same point.

Cape Ommanney bears 285° and is distant 3 miles from Wellings Point. The cape itself is fairly steep-to, but from the shore 800 yards southwestward of it a bank extends off the same distance, with depths under 5 fathoms. Not more than 9 fathoms will be found nearly ½ mile northward of Cape Ommanney. Between the latter and Wellings Point the shore is fringed by shoal water extending off 300 yards. The town of Pyrgos, situated nearly ½ mile southwestward of Wellings Point, is poor, but the houses are neatly painted. Between them there is a small artificial harbor suitable for vessels of light draft. The temperature at this anchorage in July has been noted to be nearly 10° higher than at Bashika, probably due to the radiation from the marble, and the nights are intensely hot.

Digitized by Google

Water may be obtained from a stream westward of an old tower either by landing casks and rafting them off, or with a long hose and engine.

Current in the road.—The navigating officer of the British naval vessel *Edinburgh* remarks: "While the fleet lay in the road in September, 1893, the current in the outer part was running to eastward, while at the same time the vessels anchored near Thaso Island had a current to the westward."

Thaso Island, with its elevation and coast projections, especially Cape Kephalo and the small island of Panagia, southward of the island, forms several landmarks.

The best anchorage is in the vicinity of the pier, in about 6 to 9 fathoms.

There are no lights nor pilots, but two tugs exist, a steamer and a motor boat. They serve specially for towing lighters, but the steamer goes twice weekly to Kavala for mails.

Quarantine and customs.—A vessel is boarded on arrival; a certificate of health is demanded, but otherwise formalities are fairly simple.

Roadstead and landing.—The roadstead is open, and lies entirely unprotected from south to west-southwest winds, and with stormy winds from these directions it is advisable to leave the roadstead. Northerly winds, however, prevail, and vessels lie well upon the roadstead. The coast is steep-to.

Pier.—An iron pier is built into the sea near the steep coastal declivity, where the mining establishments are situated. It serves specially for shipping ore into lighters, by means of which the ore is brought on board the seagoing vessels. The pier is connected with the sheds for the storage of ore by a railroad line. The ore is brought on tipping wagons to the shoots, and thence to the lighters, each of 12 to 10 tons capacity. The transfer of cargo goes fairly quickly in good weather.

Communication with the land is maintained by vessel's boats.

Fresh provisions can be obtained as a rule, but no other vessels' requirements.

Small works of repair can be carried out in case of necessity by the Mining Company.

Water can be obtained from the mining company in small quantities, but this must be drawn by the vessel's boats.

Coal can not be obtained.

Botos Bay, which bounds Kastro Bay to the southeastward, finds some protection from southerly winds. Anchorage in 7 fathoms.

Hamidieh Harbor.—Hamidieh, formerly called Kastro, lies on the southwest coast of Thaso Island. It is a chief shipping place for ore, which is obtained to northeastward of the village from mines

Digitized by Google

lying close to the coast. The whole mining establishment is in German hands.

The village of Hamidieh lies in the lowland immediately on the shore, where also the hinterland gradually ascends. Eastward of this flat shore is a steep wall of rock, projecting southward, upon which a house stands, which forms a good landmark. Farther eastward this high point recedes and forms a small bay, where the mining establishments are situated. To the eastward of the mining establishment on the highest hill stands a conspicuous powder-house.

Anchorage.—The roadstead is open, and lies entirely unprotected from south to west-southwest winds, and with strong winds from these directions it is advisable to leave. Northerly winds, however, prevail, and vessels lie well in the roadstead. The coast is steep-to.

The best anchorage is in the vicinity of the pier, in about 6 to 9 fathoms.

Pier.—An iron pier is built into the sea near where the mining establishments are situated. It serves for shipping ore into lighters. The pier is connected with the sheds for the storage of ore by a railroad. The lighters are from 10 to 12 tons capacity.

Tugs.—Two tugs exist, a steamer and a motor-boat. They are used for towing lighters, but the steamer goes twice weekly to Kavala for mails.

Quarantine and Customs.—A vessel is boarded on arrival; a certificate of health is demanded, but otherwise fomalities are fairly simple.

Supplies.—Fresh provisions can be obtained as a rule, but no other vessel's requirements. Water can be obtained from the Mining Company in small quantities, but this must be brought off in the vessel's boats. Coal cannot be obtained.

Small works of repair can be carried out in case of necessity by the Mining Company.

Sotiros.—A village called Sotiros is situated on the northwest coast of Thaso Inland, and connected by a railroad with Cavamith. A pier is situated there for loading ore from sheds, off which vessels can anchor within 400 yards.

For vessels coming from the southwestward the mines and railroad lines are easily recognized.

The shoals on the coast between Cape Kephalo and Sotiros are easily recognizable by the light green coloring of the water. The roadstead is protected against south and east winds.

Botos Bay, which bounds Hamidieh Bay to the southeast, finds some protection from southerly winds. Anchorage in 7 fathoms.

Panagia Island lies off the south point of Thaso Island. It rises steeply, and is with difficulty accessible, the only landing place being

Digitized by Google

in a small bay on the southern side of the island. An isolated rock, 82 feet high, is situated off the southeastern point. The island is now uninhabited, except for birds and rabbits; the little bay abounds with fish, crabs, cuttle-fish, and, in certain months, with oysters.

Kalamuti Harbor.—Koan Point, the northern point of the western entrance to Thaso Strait, is very low, projects to the southwestward and is surrounded by shallow water to a distance of from 200 to 400 yards; the point, however, may be passed at a distance of ¼ mile. The low shore eastward of the point forms a bay upward of 1 mile deep, and at the extreme eastern end of the bay, 3½ miles from Koan Point, protected from the southward by Kalamuti Point, is the little harbor of Kalamuti, called Keremidli by the Turks.

The harbor affords shelter for four vessels of heavy draft in 7 to 8 fathoms of water, and inshore berths for two smaller vessels in about 6 fathoms, from all winds except those between south-southwest and west, which, however, are not of frequent occurrence. The anchorage, almost the only safe one for large vessels between Saloniki and the Dardanelles, is preferable to that of Panagia Road, excepting in southerly winds, as at the latter place the varying current with even a moderate breeze causes a considerable sea. There is a short pier at Kalamuti, and the village is composed of about a dozen houses.

Shallow banks.—There are two bathing houses on the southern shore of the harbor. A depth of 5 fathoms will be found 50 yards off the western one and the same depth 134 yards from the inner bathing house. Two hundred yards southward of the western bathing house are two round clumps of trees close together. From the northeastern sandy shore of the harbor a shallow bank makes off 250 yards, where the depth is only 2 fathoms.

Supplies.—The plain is well wooded for about 6 or 7 miles inland, or to the foot of the hills, and abounds with game, consisting of wild boar, pheasants, partridges, and hares. Provisions are cheap and abundant, and fish also plentiful.

Cape Kara Su.—At about 5 miles eastward of Kalamuti Point is Cape Kara Su, at the western outlet of the Kara Su (ancient Nestus) River. From the cape the low shore trends northeast and east 9 miles to Cape Balustra. The shore for the first 5 miles from Cape Kara Su is broken through occasionally by the changing outlets of the river, into which there is scarcely a passage for a boat.

(For description of the coast eastward of this locality, see p. 406 et ante.)

Digitized by Google

CHAPTER V.

THE CYCLADES, OR WESTERNMOST OF THE SOUTHERN ISLANDS OF THE ARCHIPELAGO.

The Cyclades, so named from their surrounding Delos, the birthplace of Artemis (Diana) and Appollo, are those islands of the archipelago belonging to the kingdom of Greece. The principal islands commencing on the southwest are Milo, Siphano, Serpho, Thermia, Zea, Syra, Jura, Andros, Tinos, Mykoni, Paros, Antiparos, Naxos, Amorgos, Nio, Polykandro, Sikinos, Santorin, Anaphi, etc. Zea and a portion of Andros are described in Chapter III and the remainder of the above islands in this.

Ananes Islets.—Situated 9 miles 240° from Paximadion Islet at the southwestern end of Milo is a cluster of small rocky islets, the highest of which, named Ananes, is sharp pointed and about 150 feet high; they can be seen at some distance, and when bearing 102°, 7 miles appear as seven islets. It would be well not to approach them too closely.

Milo (Milos) Island, the southwestern of the group, is of volcanic formation, mountainous, and about 10½ miles in length east and west. The eastern and western portions are about 6 miles in breadth, but its width in the center is reduced to 1 mile by a bay which runs in on the northwestern side. Near its southwestern end Mount Elias, the summit of which commands extensive views of the islands of the archipelago and the mountains of Crete, rises 2,538 feet above the sea. Although the surface of the island is generally rugged and mountainous, with a naked and sterile appearance, the valleys and low grounds are extremely fertile, producing corn, cotton, oil, wine, oranges, and other fruit in abundance, as well as pasture for cattle.

Volcanic agency is still active, as shown by its hot springs and mines of sulphur and alum; the hottest of these springs is on the beach at the head of the large inlet or bay, and about ¾ mile from the old town of Paleo Khori, the ground around being impregnated with sulphur. In the side of a little rocky height above is another in a natural cave known as the Bath, which is frequented by persons afflicted with scrofulous diseases. To the southward of the height the land is low and marshy with salt pans, which cause malaria.

Trade.—The exports are manganese, sulphur, millstones, and gypsum; the imports consisted only of daily necessaries.

Digitized by Google

Port Milo.—On the northwestern side of the island is a large inlet extending 5 miles to the southeastward having a breadth of 1 mile between the town of Kastro and Kalamaria Point and widening to 2 miles at its head, with generally high bold shores and deep water throughout. The bay affords accommodation for a large number of vessels and is much frequented by those bound to Constantinople, Smyrna, and elsewhere when unable to proceed during northerly or northeasterly gales.

Akrathi Islets.—Two-thirds of a mile northwestward from Lakida Point, the northeastern entrance point of Port Milo, are the two rocky islets of Akrathi nearly united, with a deep and clear passage between them and the point.

Light.—A fixed red light is shown, at an elevation of 253 feet, from a square masonry tower, 23 feet high, on the northwestern point of the western Akrathi Island; visible 16 miles. (See Light List.)

Monopodro Rock, a remarkably bold rock 15 feet high, lies 400 yards off the point next southward of Lakida Point, and bears from the latter 209° ½ mile.

Bombarda Point.—At 3¼ miles within the entrance on the northeastern side is Bombarda Point, a bluff headland, and ½ mile eastward of it is the village of Skala of Adamandos, which contains a population of about 700.

A white pyramidal monument, in memory of those who fell in the Crimean War, is situated 400 yards to the northwestward of the lighthouse.

Skala.—There is a good landing pier at Skala, and the church is very conspicuous.

Light.—A fixed green light is exhibited on Bombarda Point from an iron mast attached to an iron building. The light is elevated 134 feet above the sea and 20 feet above the ground; visible 4 miles. (See Light List.)

Anchorage.—Vessels may anchor in any convenient berth, in from 10 to 25 fathoms, mud; the further out the better holding ground, and a sailing vessel will more readily get to sea in the event of a southerly wind. The bluff points of Bombarda and Kalamaria in range with the summit of Anti Milo bearing 296° and the village bearing 338° will be a fair berth for a large vessel. The water shoals rapidly, and if the anchor is in 20 fathoms the vessel's stern when swung inshore with a good scope of cable out will be in about 12 fathoms; the holding ground is good. The squalls off the southern shore are at times heavy.

In the approach to the bay Milo Island on some bearings from a distance appears like two peaked hills. Anti Milo being high, round, and conspicuous, is an excellent distant mark.

Digitized by Google

Kastro.—The town or large village of Kastro stands on a rocky elevation on the northeastern side near the entrance to Milo Bay and is the seat of the local government; combined with Tripiti and Plakis, close to it on the southeast and east, it contains the greatest portion of the inhabitants of the island, amounting to about 5,400, mostly fishermen and sailors, who formerly were reputed the best pilots in the archipelago.

Supplies.—Small quantities of provisions may be obtained, but very little water.

Communication.—There is weekly communication by steamer with Syra, and thence with the rest of the world. Kastro is a telegraph station.

Anti Milo (Antimilos) Island is rather more than 2 miles in extent north and south and 1½ miles east and west, somewhat triangular in shape with its pointed end to the south. It is 2,250 feet high, rugged, steep all round, and uninhabited except by a few wild goats. Vlykadion Point, its southern end, is nearly 5 miles from the nearest part of Milo and bears 285° from Cape Vani, a high hill of craggy rocks and the western entrance point of Milo Bay.

From the northward Anti Milo is easily distinguished at a great distance by its rounded form, and appears considerably higher than Milo. The channel between it and Milo is deep and clear, but sailing vessels should avoid the calms and sudden gusts of winds by not passing too close to the shore on either side.

Paximadion Islet, off Psalis Point, the southwestern end of Milo, is surrounded by rocks and should be given a wide berth. The channel between the islet and Psalis Point is about 1,400 yards wide and clear of danger if a mid-channel course be maintained.

Light.—A group flashing white light, unwatched, visible 15 miles, is erected on Paximadion Islet.

The light is exhibited, 85 feet above the sea and 10 feet above the ground, from a white iron tower on a masonry base on the summit of the island. The light is obscured by Antimilos Island. (See Light List.)

Zephyr Rock.—At 7 miles eastward of Psalis Point is Zephyros Point, from which shallow water extends 800 yards to the southward with 4 and 5 fathoms water on it; at the extremity of the shoal is a dangerous sunken rock, with less than 1 fathom water over it, named Zephyr, with deep water close to it. The southeastern extremity of Polino Island in range with Steli Point bearing 53° leads well southward of the rock.

Steli Point, the southeastern extremity of Milo, is the termination of a narrow projecting tongue of land with a large rock at its extremity and shallow water 300 yards southward of it.

Ktenia Rocks.—Nearly 3.2 miles 130° from Steli Point are two isolated rocks above water, and steep-to, named Ktenia or the Pigeons. Caution is necessary when in their vicinity at night.

Digitized by Google

Kimolos or Argentiera Island (named Kimolos by the Greeks and Argientiera by the Romans from silver mines which formerly existed) is 4½ miles in length north and south by 3½ miles in breadth, 1,305 feet high, with irregular and generally rocky shores. It contains a population of about 2,000, and the only town or village called Kimolos, is on its southeastern side. The ancient town was at Liniko, on the southwestern coast, where St. Andrea Islet, now about 200 yards from the shore, was formerly united to the coast and formed a small harbor; the islet has still remains of houses on it. The barren soil affords but little sustenance for the inhabitants, who mostly lead a seafaring life. Iron ore is shipped from this island; a considerable quantity of building stone is also exported.

Poloni Pass.—Kimolos is separated from Milo by a passage ½ mile wide, bordered on either side by shallow water, especially at the southern end of Kimolos, where the shoal, on which the sea at times breaks, extends more than halfway across, leaving a channel 7 fathoms deep and 200 yards wide, called Paloni Pass.

Poloni Rock.—The shallow rocky ground which extends southward from the southern point of Kimolos borders the coast of the island eastward at the distance of 700 yards; and beyond this distance, at the eastern entrance to Poloni Pass, is the rock of the same name with 4½ fathoms water on it and 6 fathoms between it and the rocky ground bordering the coast of Kimolos.

St. Georgio Islet.—St. Georgio is a narrow irregularly formed islet about ½ mile in length north and south, with rocks above water close to its southwestern end. At about 700 yards westward of its northern end is a rock above water with shoal ground extending from it 600 yards southwestward; between the rock and islet there are from 6 to 10 fathoms water. St. Georgio Islet and the rock westward of it occupy a position nearly equidistant from Milo, Kimolos, and Polino, and the water is deep in mid-channel all round.

Pyrgui (St. Eustache) Islet, about 600 yards in extent, lies 1,400 yards northward of St. Georgio, having a narrow passage between it and Kimolos; the islet has a narrow bank all round it.

Light.—A fixed red light is shown, at an elevation of 85 feet, from a square stone tower, 23 feet high, on the northern extremity of Pyrgui Islet; visible 5 miles. (See Light List.)

Temporary anchorages.—In case of necessity, during northerly winds, vessels might find temporary anchorage southward of Kimolos, with the above islets on the east and Milo on the west; also with westerly winds, off the village of Kimolos.

Polino (Polyaigos) was called also Isola Brusiata, or Burnt Island, from its great sterility. Cattle rearing is the principal occupation of the population, who only numbered 23 in 1896. It is 3¼ miles in length northwest and southeast and 1,170 feet high; its

Digitized by Google

coast, generally bold, is irregular, forming two or three little coves, with rocks above and below water here and there, and from a little islet on the west side sunken rocks extend off 200 yards.

Maskula Point, with an islet off it, is a slight projection on the northeastern side of Polino Island.

Light.—A flashing white light is shown, at an elevation of 408 feet, from a circular masonry tower, 28 feet high, near Maskula Point; visible 28 miles. (See Light List.)

Pyrgui Strait.—Polino is separated from Kimolos by a channel nearly 1,800 yards wide, clear and deep, and called Pyrgui Strait. In the navigation around and among these islands the chart and the eye are the best guides.

Siphano (Siphnos) Island is 9½ miles in length, with an extreme breadth, at the southern end, of 4½ miles, whence it tapers to Cape Phillippo (Khersonisos), its northwestern extremity. A range of mountains extends throughout, and Mount St. Elias, distinguished by a chapel on its summit, near the center of the island, is 2,280 feet above the sea. Siphano is famous for the salubrity of its climate and the fertility of its soil, and produces corn, wine, oil, silk, poultry, fruit, etc.; straw hats of a rough manufacture are exported, and a considerable trade is done in cattle and pottery. The population is about 4,000; they are quiet, civil, hospitable, and industrious, worthy of their picturesque, fertile island and delightful climate.

In ancient times Siphano was celebrated for its mines of gold and iron; the latter are on the northeastern side of the island, with a narrow, low entrance at the foot of a cliff, cut into the solid rock; the marks of the miners' tools were as fresh in 1844 as if only then done. The mines may be entered by each person bearing a torch, but after advancing a considerable distance the explorers are stopped by the accumulation of rubbish. The smelting furnaces are cut out of the solid marble rock on the point shelving to the sea, and either by the sinking of the land or rising of the sea are now, many of them, under water, some quite submerged and others only partially so, and surrounded by the scoriæ of former days.

A group of villages, numerous for the size of the island, stand on a kind of elevated plateau toward the east, 890 feet above the sea; they are clean and exceedingly healthful, and present a most imposing appearance from seaward. The land around them is well cultivated extremely fruitful, and abounding in springs of excellent water. The northern village of the group is the capital, or residence of the local authorities, is known by the name of Appolonia, and has a population of about 800. Several square windmills with fixed leads facing the north, from which quarter the wind generally blows, are erected on the ridge of land on which the town stands.

Digitized by Google

Communication.—There is weekly connection by steamer with Syra and Piræus. Siphano Island is in telegraphic communication with the rest of the civilized world, the town of Kastro being the telegraph station.

Water for shipping is not to be procured on the island, but live stock is plentiful.

Anchorages.—The island has no good ports; anchorage may be obtained by small vessels inside Kitriani Islet, in 15 fathoms, but the holding ground is indifferent, and at Port Pharos in better holding ground. Vessels may anchor in Platialos (Platys Yalos) Bay with a northerly wind, if not blowing too hard; but the squalls off the highland are so heavy as to render it impossible to contend against them under sail.

Coasting vessels in summer anchor close under Kastro Point, where there is an old dilapidated town, with a population of about 300, and some remains of an ancient castle. Port Vathy, on the southwestern part of the island, is fit only for boats, the holding ground being bad, except close inshore.

Kamares Bay, open to the westward, is situated on the western side of Siphano Island and 3 miles southward of Cape Phillippo, the northern extremity.

There are two or three other bays on the northwestern coast, but they are open and exposed.

Light.—A fixed red light is shown, at an elevation of 160 feet, from a column over a dwelling, 16 feet high, on the southern side of Kamares Bay; visible 6 miles. (See Light List.)

Kitriani Islet, off the southeast coast of Siphano Island, is 340 feet high, nearly 1 mile long northeast and southwest and ½ mile wide. It is separated from Siphano by a channel 400 yards wide with depths of from 5 to 20 fathoms, the only danger being a rock close off the western point of Kitriani.

Dangers.—The only outside dangers to be avoided are a rock which dries 3 feet, lying 800 yards 319° from Cape Phillippo, the northern extremity of the island; and another rock, with 4 fathoms water on it, situated 800 yards 131° from the southwestern end of Kitriani Islet.

The passage between Siphano and Kimolos is 6½ miles wide, and, with the exception of the 4-fathom rock just mentioned, is clear and deep.

Siphano Channel.—The passage between the sunken rock off the northern end of Siphano Island and Serpho to the northwest is 6½ miles wide, and, with the exception of the rock off Cape Phillippo, is clear of danger.

Serpho (Seriphos) Island, the next northward of Siphano, is nearly circular, about 5½ miles in diameter, and attains an elevation of 1,585 feet above the sea. It is generally sterile, but produces a

Digitized by Google

little corn, wine, and a small kind of onion. There are traces of ancient mines on the southwestern part of the island, and lodestone is still to be procured; there are also the remains of a tower of white marble. Seriphos, the largest village in the island, stands on a curious conical hill, about ¾ mile from the head of Port Livadhi. The whole population of the island amounts to about 4,000.

Serpho, a large modern village, is situated at the head of the inlet 1½ miles northeastward from Cyclops Head. The hills above this village are covered with mining works. A cantilever loading jetty is situated in this inlet, and another in the small cove close northward of it. A conspicuous white church stands on a hill above the village.

Mooring Buoys.—In the northwestern corner of Kutala Bay there is a large village, near which is a loading pier with two mooring buoys off it.

Light.—A group flashing white light, elevated 212 feet above the sea and visible 20 miles, is exhibited from a square tower, 32 feet high, erected on Point Spathi, the southeastern point of Serpho Island.

Port Livadhi (Livadion), on the southeastern side of the island, extends northward about 1¼ miles and is nearly 700 yards wide. The water is rather deep, but at the head of the port the anchorage, in from 12 to 8 fathoms, sand and weed, is good in any weather; on the western side of the entrance is a small reef awash, close inshore. With a sailing vessel access is difficult except with a fair wind. In entering keep in mid-channel, give the inner point on the west, which is low with a chapel on it, a berth of 200 yards, and anchor where convenient.

The population of the port is about 600.

During part of the summer the heat in the port is excessive; surrounded as it is by an amphitheater of rocky hills, which hardly cool, the heat is nearly the same at all hours, and for days the thermometer may register 98° at 10 p. m.

A cargo of 2,300 tons of iron ore, has been loaded in four days. The loading berth has a minimum depth of 21 feet, mud bottom, and the remainder of the port has ample and safe anchorage space for three or four steamers.

There are several other inlets around the island, but none of them useful as anchorages.

Light.—A fixed red light, elevated 35 feet, is erected on an iron hut with iron column, and situated on the point southeastward of Livadhi village. The light is visible 5 miles.

Water.—A little water may be procured from the wells on the low ground at the head of Port Livadhi.

Trade.—Iron ore is exported.

Communication.—There is weekly steamer connection with Piræus, Syra, and the adjacent islands. Port Livadhi is also a telegraph station.

Digitized by Google

Dangers.—The little islet of Mikro lies close to the southern point of the island; nearly midway between it and the eastern point of Kutala Bay is a rock with less than 1 fathom water over it, with deep water round it, and difficult to be seen on account of the color of the bottom. To avoid it keep well outside the line of the islet and point.

Another shoal, with less than 1 fathom water on it, lies nearly ¼ mile from the north horn (a bluff 400 feet high) of Psarometokhion Bay, on the northwest coast. With the above exceptions, there are no off-lying dangers round the island.

Vus Islet is small, about ¼ mile in diameter, 435 feet high, bold with deep water near it, lying 63° from Amyno Point, the northeastern entrance point of Port Livadhi, and 1 mile from the coast.

Seriphopulon lies 4¾ miles northeastward of Serpho; this islet is 1½ miles in length east and west, ½ mile in maximum breadth, tapering to each end and forming a curve northward, with steep cliffs on the south; it is about 650 feet high, bold, and clear of danger.

Serpho Channel.—The passage between Serpho and Thermia on the north, is 7¾ miles wide in its narrowest part, and called Serpho Channel. The islet of Piperi lies between the eastern ends of the two islands and 4 miles northwestward of Seriphopulon. Piperi is 800 yards in diameter, inaccessible, with deep water round it, and the currents are strong in its vicinity.

Thermia (Kythnos) Island is irregularly formed, 11½ miles in length north and south, with an extreme breadth of about 4 miles; the highest of its hills near the center of the island is 965 feet above the sea, and its coast line is indented with several little ports and coves. The island derives its modern name from the hot baths at its northeastern part, and which are said to be of great efficacy in all scrofulous and rheumatic complaints, and many invalids resort hither in the summer from Greece and Turkey, but the accommodation is very indifferent. The population of the island is about 3,200.

There are only two towns or villages in the island; the modern capital, Kythnos, is about 1½ miles southward from Port Irene, and contains a population of about 2,000. At 1½ miles southward of Kythnos (sometimes called Messaria), and not far from the greatest elevation, is the village of Sillacca or Dryopis, containing a population of about 2,400. Here is a large grotto; a few veins of marble and chalk intersect the rock and form stalactites.

The ancient city (Kythnos) stood on the west coast, over a cliff about 600 feet above the sea and between the ports of Apokrusis and Piskopi. The solitary grandeur, magnitude, and solidity of the masonry of the ruins attest its former magnificence; the ruins have acquired among the islanders the name of Hebræo Kastro or Jews'

Digitized by Google

Castle, a name applied in contempt by Greek peasants to any ancient building erected by strangers.

Trade.—The island produces barley, corn, wax, wine, and honey, and iron ore. It abounds in red-legged partridges, and there are also sheep, goats, and pigs.

Communication.—There is connection by steamer twice a week with Piræus and Syra and once a week with the island of Amorgo and others of the Cyclades. Sillacca or Dryopis is a telegraph station.

Port Merika, on the western side of Thermia, is a narrow inlet about 1,100 yards deep, open to the northwestward, with a rock above water lying 200 yards off its southern point of entrance. Inside the shelter is good, but a vessel under sail experiences diffieulty in leaving except with a fair wind.

Light.—On the western extremity of the northern entrance point of Port Merika is a fixed light, with red and green sectors, at an elevation of 75 feet, on a rectangular masonry tower above the lightkeeper's dwelling; red light visible 8 miles, green light 6 miles. (For sectors of light, see Light List and Charts.)

Port Irene is on the east coast, 2¼ miles from Cape Kephalos, the northern extremity of the island. A large building, in which are the hot baths, is easily distinguished, and when it bears 254° should be steered for. The only danger is a rocky patch with ½ fathom water over it on the northern side of entrance; it can, however, always be seen and avoided. The best anchorage is in a little creek on the southeastern side of the port, where small coasters lie in safety.

The hot baths, about 200 yards from the beach at the head of the port, are extensive, but much out of repair. The waters vary in temperature, the hottest being 131°; they are brackish and disagreeable to the taste, but clear; by overflowing, they cover the ground to the sea with a porous crust, here and there of a reddish color from the iron, which with salt are their principal ingredients.

Light.—A fixed red light is shown, from an elevation of 51 feet, from a metal support 26 feet high at the bathing place on the southern entrance point to Port Irene; visible 5 miles. (See Light List.)

Port St. Stephanos.—At nearly 5½ miles south-southeastward of Cape Kephalos is Cape St. John, the eastern extremity of the island, and about 1 mile southwestward of the latter is the entrance to Port St. Stephanos. The port extends in a little more than ¾ mile, and is about the same distance in breadth; a projection from the head of the port forms an inlet on either side of it. A sunken rock lies nearly 200 yards off the southeastern extremity of this projection, and a small shoal with ½ fathom water on it, which can always be seen, lies 375 yards off the southern entrance point of the port. The port is open to the southward, and the water is deep in the outer

Digitized by Google

part, but near its head there are from 5 to 20 fathoms. It is available for anchorage, but as there is nothing to be obtained it is seldom visited.

There are several small bays on the western side of the island, but useless as anchorages. The coast all round is clear of off-lying dangers.

Thermia Channel, between Thermia and Zea Islands, is a little more than 6 miles wide, clear and deep. The current in this channel runs to the southwest with much strength and stronger than between Zea and Makronisi, although close inshore along the southeastern side of Zea it sets to the northeastward. (For Zea Island, see p. 121.)

Syra (Syros) Island is irregular in shape, 9¼ miles in length north and south, with an extreme breadth at the southern end of 5⅔ miles. It is hilly, the two greatest elevations being Mount Nites, rising over the south coast, and Mount Pyrgo, 1,415 feet high, about 4 miles from the northern end; the hills are chiefly formed of mica slate, though near the sea there is marble of an inferior quality. The island is well cultivated, and produces barley, cotton, figs, olives, wheat, wine, etc. A large quantity of vegetables are sent to Athens and Constantinople in the early season. The population of the island is about 27,350.

The ancient Greek city stood on the site of the present capital town of Syra or Hermopolis on the shore of Syra Harbor on the eastern side of the island. In the Middle Ages the inhabitants retreated for security from the pirates who then infested the archipelago, and built another town on the summit of the steep peaked hill in the rear, now called Old Syra. The island was of no importance till the war of the revolution, when a great influx of refugees from different parts of Greece and the islands, especially from Khios and Psara, occurred. On the site of the ancient city the modern town gradually rose to its present flourishing condition, and, being in a central position, is the emporium of the archipelago and its harbor a port of call for shipping, more especially steamers of nearly all nations and from all parts.

Coast.—The coast line of Syra is sinuous, forming numerous bays and coves, but they are all open and exposed. It is generally bold, with but few off-lying dangers.

Grammata Head, on the west coast and 1 mile southward from Cape Trimesson, the northern extremity, is conspicuous to a vessel approaching Syra from the westward. This perpendicular rocky precipice stands out conspicuously from the background in the shape of a bell, and is of a light-yellow color.

Delphini Rock, with 2 fathoms water on it, and steep-to, lies off the west coast, 700 yards northwestward of the south point of Del-

Digitized by Google

phini Bay. The east side of Barbarusa Islet in range with the northern extremity of Trakhyta Head bearing 18° leads on the rock; the islet should therefore be kept well open.

Trypa Rock, with 1½ fathoms on it, is the summit of a shoal nearly 400 yards in extent northwest and southeast, lying 900 yards 198° from Phokia Point, the eastern extremity of Syra Island; the shoal is steep-to. Cape Vilostasi (Vilostasion) the southern extremity of the island, bearing 251°, open of Xodra Head, leads southward of the shoal; the whole of Gaidaro Island, open of Phokia Point, bearing 349°, or the land to the northward in range with the western end of Gaidaro Island bearing 344°, lead eastward of it.

Aspro Islet, ¼ mile in length, somewhat triangular in form, steep at the southern end, and sloping toward the north, lies 1 mile southeastward of Phokia Point. The water is deep off its southern end, but a tongue of shallow rocky ground extends 600 yards 327° from the western point of the islet, having near its extremity a rock awash. Another rocky ledge extends 300 yards to the northeastward of the islet, and outside this ledge at 500 yards from the islet is a shoal patch with a least depth of 3¾ fathoms falling suddenly to deep water.

Vessels passing Aspro Islet should give it a wide berth. The passage between the northwestern tongue and the shallow water around Phokia Point is 1,400 yards wide and the distance between the tongue and Trypa Choal ¾ mile. The passage between Aspro and Syra may be safely used by keeping the western end of Gaidaro just open of Phokia Point, or the northeastern extremity of Syra in range with the western end of Gaidaro.

Buoy.—A red and white whistle buoy is moored in a depth of 4 fathoms on the shoal extending to the northeastward of Aspro Islet, but it is not to be relied upon.

Gaidaro Island.—This island is 1,400 yards in length, 700 yards in breadth, and about 97 feet high. It lies 1¼ miles 113° from the extremity of Syra Mole, and affords some shelter to the anchorage when the wind is from that quarter.

A rock nearly awash lies 50 yards off the north point of the island.

Anchorage.—The distance of Gaidaro Island from the shore southwest of it is about ½ mile, and the space between affords tolerably good anchorage in from 12 to 18 fathoms water, coarse sand and shells with patches of weeds, sheltered from northeasterly winds, which at times blow strong. On a fine day when the water is smooth the anchor may be seen in 12 or 13 fathoms. There is a good summer anchorage, but open from south to east. An islet lies close to the eastern side of Gaidaro, with 3 fathoms water between.

Light.—On the western summit of Gaidaro is a circular stone tower, 97 feet high, from which is exhibited, at 224 feet above the

Digitized by Google

sea, a fixed and flashing white light, visible 17 miles. The light is sometimes seen over Phokia Point. (See Light List.)

Syra or Hermopolis town contains a population of about 18,000, nearly all engaged in mercantile pursuits; a quay with numerous warehouses and handsome houses of white marble attest its mercantile importance. In a handsome square in the center of the town is the town hall and other public offices. There is an Italian opera and a Greek theater, and though the streets are narrow and crooked, they are well paved, lighted, and clean. Old Syra, practically connected by buildings with Hermopolis, is perched on the remarkable conical hill which commands the port; the ascent is rather toilsome, and on the summit is the church of St. George, from which is an extensive view. Old Syra contains a population of about 3,272, mostly Roman Catholics, the descendants of the Genoese and Venetian settlers.

The new city of late years has grown back and upward to a second hill, which, with Old Syra, present from the mouth of the harbor the appearance of two distinct conical hills covered with white houses, each hill being crowned with a church.

There is an Anglican Church, divine service being held at 10:30 a. m. on Sundays, excepting in June, July, and August, when most of the congregation reside in the interior of the island. It is the principal seat of missionaries for the Levant, who have schools here. There is likewise a British burial ground.

The climate of Syra is remarkably healthful, extreme cold or frost being unknown, snow falling once or twice in three or four years and melting immediately. In summer it is occasionally sultry in calms or with south or southwest winds, and in the lower part of the town, which is built and paved with crystalline limestone, it is then disagreeably hot. The prevailing wind, however, is from the north, and blows throughout the summer, with occasional lulls or changes to the south, keeping the air cool, especially in the more elevated parts of the town. It rarely rains, except in the winter, and the springs of the town being insufficient for supplying water, it is collected from the roofs and terraces of the houses into cisterns, of which every house has one. This water is used for drinking by the inhabitants, who prefer it, as it is soft and good.

Syra Harbor, the only port for shipping, is on the eastern side of the island, where the coast forms a bay open to the eastward. On the northern side of the bay a small peninsula, formerly an islet, projecting southward and prolonged by a mole with depths of from 10 to 3½ fathoms, good holding ground, affords excellent shelter. The mole has been extended to 430 yards and provides excellent shelter

Digitized by Google

in bad weather. Vessels should give the visible end of the mole or breakwater a berth of at least 150 yards.

A channel, 330 feet long and 28 feet deep, leading to the patent slip has been dredged.

The bay is bordered all around by a narrow bank, which in the southern part is rocky and extends 400 yards from the shore; its edge, in a depth of 3 fathoms northwestward of the New Lazaretto, is marked by a cylindrical stone beacon 13 feet above the sea, with three horizontal red bands.

Steamers of 20 feet draft lie safely at the head of the harbor, with sterns secured to bollards on the quay. Larger vessels lie farther out with their sterns fast to bollards on the mole. There are no bollards on the extension of the mole.

To avoid impeding the navigation of the harbor and for the benefit of fresh and cool air it is advisable for naval vessels to secure their sterns to the east mole after anchoring. This should not be too much relied on in a heavy blow, as the mole is only 3 feet above the water, and, being built of loose blocks of stone, does not offer a very solid foundation. Battleships that have anchored here have laid out anchors over the mole so as to grasp the sea face. A vessel may haul her stern close to the mole, there being deep water within 20 yards of it.

Pilots.—On arriving outside the harbor the vessel is boarded by a pilot, who points out, and in the case of a merchant vessel, pilots them to a berth.

Lights.—Two fixed red lights placed vertically are shown from an iron post 56 feet within the outer end of the mole or breakwater. (See Light List.)

Outer anchorage.—A large vessel requiring coal and not wishing to go inside should go into 10 fathoms water, sandy bottom, and moor with the New Lazaretto Point bearing 185°, and the mill on the beach 259°. With a northerly wind and farther out, the coal lighters will not generally be able to remain alongside.

Anchorage outside the breakwater is not recommended on account of the danger of fouling telegraph cables, of which there are eight.

Communication.—Telegraph cables belonging to the Eastern Telegraph Co., laid direct from Syra to the Piræus, Thermia, Khios, Paros, and Tinos Islands, and Megalo Kastron (Crete), afford connection with the principal ports of the archipelago and the general world system.

There are frequent and regular lines of mail steamers to Piræus. The following are the principal steamship companies maintaining a regular service with Syra: Cunard, monthly from Liverpool, Patras, and Corfu; Moss, monthly from Liverpool, Gibraltar, Malta, and

Digitized by Google

Black Sea; Deutsche Levante, monthly from Hamburg, Rotterdam, Malta, and Syrian ports; Pappayani, fortnightly from Liverpool, proceeding to Smyrna and Constantinople; Messageries Maritimes, fortnightly, from Marseilles, Patras, Saloniki, Constantinople, and Odessa; and Austrian Lloyds, fortnightly from Trieste, Corfu, Patras, Constantinople, etc. There is also connection between Syra and the other Cyclades and Crete by Turkish steamers twice a week. Thus outside the archipelago there is a more or less regular connection with London, Liverpool, Marseille, Gibraltar, Malta, Trieste, Hamburg, Crete, Smyrna, Constantinople, and Black Sea ports.

Quarantine.—Vessels arriving from infected ports, or with foul bills of health, are sent to the island of Rhenea or Greater Delos when the term of quarantine exceeds five days; under that period, quarantine can be performed in the harbor of Syra. There is a hospital supported by the municipality and by voluntary contributions. Patients of all nationalities are admitted free of charge.

Repairs, etc.—An establishment belonging to the Forges et Chantiers de Syra Co. is capable of effecting large repairs to hull and machinery.

Vessels up to about 600 tons have been built here, but of late years this industry has considerably declined. The wood comes chiefly from Constantinople.

Supplies, water.—Fresh meat, vegetables, and other provisions can be obtained. Water is scarce, and bad in summer.

Coal.—About 110,000 tons of Welsh coal are imported annually, and 12,000 tons are usually in stock. There are 32 lighters of from 20 to 160 tons, and from 850 to 1,000 tons can be delivered in 24 hours.

Patent slip.—The same company possesses a patent slip, on the blocks of which depths of 10 feet forward and 14 feet aft are afforded. This slip is capable of taking all classes of vessels up to 2,500 tons. (See Appendix.)

Trade.—The exports consist chiefly of leather, vegetables, tobacco, emery stone, valonia, citrons in brine, etc.; the chief imports being raw hides, grain, rice, linseed oil, salt fish, coal, woollen and cotton yarns, etc.

Nata is a small flat islet about 25 feet above the sea, lying 5½ miles 133° from Gaidaro Lighthouse and nearly on the parallel of the southern end of Syra. There are 3 and 4 fathoms water around its northern side, and about 300 yards 254° from it is a detached rock with less than 1 fathom water on it; the water all round the islet at the distance of ¼ mile is deep, and at night it should be carefully avoided.

Light.—A flashing white light, unwatched, visible 13 miles, is erected on Nata Rock. The light is exhibited from a white iron tower on the western summit of the islet.

Digitized by Google

The light is exhibited, 45½ feet above the sea and 16 feet above the ground, from a white iron tower on a small house. (See Light List.)

Jura (Gyaros) Island is situated 7 miles northwestward of Syra; it occupies a central position between Zea and Thermia on the southwest and Andros and Tinos on the northeast, is roughly triangular in shape, and nearly 4¾ miles in length east and west, its eastern side being 2¾ miles in length. Jura is moderately high, barren, possesses no harbor, and had a population of only 18 in 1896. Glaro, a narrow islet, 1,400 yards in length, is nearly joined to the southeastern end, and another but smaller islet lies on the northern side of the western point. A sunken rock also lies about 200 yards from the shore ¾ mile westward of the northeastern point; elsewhere the water is deep and free from off-lying danger.

Andros Island, the northernmost and largest of the Cyclades, is 21 miles in length in a northwest and southeastern direction, with an extreme breadth of about 8½ miles. The island is mountainous throughout, the water parting being chiefly on the southwestern side, with spurs or ridges extending northeastward. Mount Kovari, near the middle of the island, attains an elevation of 3,204 feet, and the summits of the mountains are covered with snow for months in the year. The island produces a large quantity of silk, fruit, and wine, and corn generally sufficient for its own inhabitants. The town of Andros, or Kastro, is on the eastern coast, but there are various other towns or villages, containing altogether a population of about 18,000.

West coast.—The description of the northwestern coast, from Cape Phassa to Gavrion Bay, is given on pages 137 to 140.

In continuation of the west coast to the southeastward, Thiakion Point, 2½ miles from Megalo Islet, is a prominent tongue of land at the base of Mount Kovari; on the southeastern side of the point is a bay about ¾ mile deep, and 1¼ miles from the point are the ruins of an ancient mole. The coast thence southeastward to the Steno Pass, a distance of 10 miles, is more or less cliffy, irregular, and backed by high mountainous land; the coast is steep-to and without off-lying dangers, but vessels under sail with northeasterly winds should be prepared for heavy squalls.

Steno Point, the southern extremity of Andros, is the termination of Mount Aranka, which, at about 3 miles northward of the point, is 2,250 feet high. From the point the eastern coast of the island trends about north-northeastward 5½ miles to Cape Hagios Kosmas, the extremity of the spur extending eastward from Mount Arkanka. The coast, being the base of the ridge, is all along steep, with no off-lying danger; it forms with the northern coast of Tinos a wide opening from the eastward to Steno Pass.

Digitized by Google

Steno Pass, between Andros and Tinos, is 1,200 yards wide, the water deep, and the course though in mid-channel, about 63° or 243°. The points on either side should not be approached too closely.

The Steno Pass is preferable to the Doro Channel for low-powered vessels bound to the northeastward or eastward with fresh northerly winds.

Current.—The current runs southwestward through the pass.

Light.—A flashing light showing alternate red and white flashes is exhibited, at an elevation of 100 feet, from a square masonry tower, 30 feet high, on the northwestern Dysvaton Islet, on the southern side of the pass; visible 16 miles. (See Light List.)

Kordion (Korthion) Bay, on the northern side of Cape Kosmo, formed between two spurs extending eastward from the western mountain range, is 1½ miles wide between Cape Kosmo and Vuni Point northwestward of it, narrowing to ½ mile at its head, and is 1½ miles deep. On the low shore at its head are the storehouses of Kordion town, which together with several villages are situated on the rising land within, the population of the district being about 5,000. The bay has convenient anchorage depths in from 15 to 5 fathoms, sandy bottom, but it is entirely open to the eastward. The mountain ridge over the northwestern side of the bay is 1,895 feet high.

Telegraph.—Kordion town is a telegraph station.

Cape Gerias—Light.—A fixed and flashing red light is established on Cape Gerias, east coast of Andros Island.

The light is exhibited, 240 feet above the sea and 32 feet above the ground, from a circular masonry tower, with keeper's house adjoining, erected on the summit of the cliff and about 145 yards from the extreme eastern point. (See Light List.)

Port Kastro is 2¼ miles northwestward of Cape Akamatis, the northern entrance point of Kordion Bay, the coast between forming one or two little indentations; the port, between two small projecting points, is about 800 yards deep and 500 yards wide, with depths of from 4 to 12 fathoms, but open to the northeast, and seldom used. A ledge of rocks, covered and uncovered, extends from the northwestern point, and on the inner part of the point is the town of Andros, or Kastro, from which roads lead to the different villages in the interior. The population of the town is about 2,000.

On the northwestern side of the point on which the town stands is a similar but larger bay than Port Kastro, with 10 or 12 fathoms water in the middle, and more generally used. A pier 200 yards long, extending southward from the northwestern side of the bay, affords shelter to a few coasting vessels. In 1900 the French naval vessel

Digitized by Google

Condor found good anchorage in 5½ fathoms 200 yards southward of the outer end of the pier.

Lights.—On Turliti Islet, situated between the two bays and on the northwestern side of the entrance to Port Kastro, is erected a cylindrical tower, 21 feet high, from which is shown, at a height of 54 feet above the sea, a fixed white light unwatched, visible 12 miles.

A fixed red light is shown, at an elevation of 33 feet, from an iron standard on Kastro Pierhead; visible 5 miles. (See Light List.)

Communication.—Greek steamers call at Port Kastro as well as at Port Gavrion.

Coast.—From Port Kastro the cliffy, irregular coast, with numerous little coves, trends north and northwestward to Cape Kabanos, the northern extremity of Andros; in this portion of the coast there are no anchorages nor off-lying dangers, and the island is exposed to the full force of north and northeasterly gales, with the attendant current. From Cape Kabanos the steep coast turns abruptly to the west-southwestward, and trends 5 miles in that direction to Cape Phassa.

Tinos Island, separated from Andros by Steno Pass, and one of the most productive of the Cyclades, retains its ancient name. It is about 15 miles in length and nearly 7 miles in breadth at the southeastern end, decreasing to the northwest and terminating at Steno Pass, where it is not 1 mile broad. The island is mountainous, and rugged hills extend throughout its length; Mount Kolembo, near the center, is 2,090 feet high, but the greatest elevation is at the southeastern end, where mount Skhionia attains an elevation of 2,340 feet above the sea.

Products.—A large portion of the sides of the mountains and hills is covered with narrow terraces for vines and fig trees; the Tinos wine is good and of two sorts, of which the white, the most esteemed, has a rich fruity flavor somewhat resembling Tokay. A great quantity of silk, the production of the island, is manufactured into stockings, gloves, etc., strong and durable. Corn grows plentifully, and there are also extensive quarries of marble, which is exported to Smyrna and other Turkish ports, after being worked into tombstones and slabs for baths and fountains.

Provisions are plentiful. Grapes, figs, melons, and vegetables are exported in great quantities, and honey is obtainable.

St. Nikolas, or Tinos, the only town of any importance, is situated on the southwestern side of the island at the foot of the hill facing the sea, on which stood the ancient city, the walls of which are still traceable. In addition to the town of St. Nikolas, which contains a population of about 2,500, there are about 50 villages, large and small, on the island, the total population in 1907 being

Digitized by Google

11,186. The Tinians are skillful, industrious, and hospitable, with a simplicity which is interesting; the women, among the most beautiful of the archipelago, possess a graceful carriage and extremely pleasant manners. Within five minutes' walk of the town is the cathedral, the pride of the Tinians, which, built of white marble, forms with its courts, schools, etc., a picturesque group of buildings, having an imposing appearance from the sea.

There are also a large number of both Greek and Roman Catholic chapels throughout the island; the communicants of the latter amount to more than half the whole population of the island.

Oxoburgo, the former capital, situated in the interior, is now nearly deserted; in 1715, when it was the principal town, it was destroyed by the Turks and surrendered by capitulation, when the fortifications were partly destroyed. The remains of the fortress occupying the steep hill to the westward of the town show it to have been a place of considerable strength, and though suffered to fall to decay, it might easily be repaired.

Ports of Tinos.—There are no good ports in the island; the mole at Stauro Bay, on the southwestern coast, affords protection to a few small vessels, but it is too limited to be of use as a port of general resort. The holding ground outside the mole is uncertain and the squalls so heavy at times as to cause a vessel to drag with two anchors down.

Tinos Harbor, at the town of St. Nikolas, is formed by two breakwaters, which afford protection for small vessels from all winds, excepting westerly ones. The entrance is about 200 yards wide, the depths varying from 1½ to 5 fathoms, the anchorage space of over 3 fathoms being only about 200 yards in diameter.

The anchorage off the harbor is not recommended, especially for sailing vessels, as there is difficulty in getting under way with the wind from the northwestward, when it is extremely variable.

Lights.—A fixed red light is shown at an elevation of 16 feet from an iron pole at the end of the north breakwater.

A fixed green light, visible 4 miles, is shown at an elevation of 16 feet from the end of the south breakwater.

Livada Point—Light.—On the extremity of Livada Point, on a rectangular masonry tower above the lightkeeper's dwelling, is an occulting white light exhibited at an elevation of 135 feet, and visible 17 miles. (See Light List.)

Anchorage.—There is anchorage to the eastward of Cape Akroteri, in Nikolo Bay, in from 10 to 14 fathoms, clay bottom. A good berth is about ½ mile from the cape, with the spire of St. Nikolas Cathedral bearing about 333°, and Cape Akroteri bearing 293°. A small shoal lies close off the cape, but it can be seen, and is not in the way of vessels coming to an anchor.

Digitized by Google

The anchorage in Nikolo Bay is convenient for vessels bound to the northward through Mykoni Channel, and also as a temporary stopping place for vessels bound to Syra during a northerly gale. In anchoring be prepared for heavy squalls and veer a good scope of cable.

Akako Rock, with 6 fathoms of water on it, lies off Nikolo Bay, ½ mile 150° from Cape Akroteri; elsewhere the bay is clear.

Cape Joannis.—There is also shelter with northeasterly and northwesterly winds under Cape Joannis, the southeastern extremity of Tinos Island, but it is difficult to reach in a sailing vessel on account of the heavy squalls which rush down the side of the mountain. The Blabi Rocks, awash or just above water, 1 mile southwestward of the cape, are ¼ mile from the shore and steep-to.

Port Panormos, on the northern side of the island, possesses a secure anchorage for small vessels in the western part of the bay, where there are some storehouses, and sheltered from northerly winds by Planumi Islet. The northerly winds which prevail most of the summer months, blow directly into all the other bays on this side of the island. The port is frequented by small vessels for tombstones and marble slabs, the product of the extensive quarries in the immediate neighborhood. The marble is of three kinds, dark gray with black veins, white, and green.

Communication.—Near Port Panormos is a telegraph station.

Beacon.—On a bank in the harbor of Panormos, at a distance of ½ mile to the westward of the southern point of Planumi Island, there is a stone-built column in the form of a truncated cone on a circular base. This port must not be mistaken for that of the same name on the adjacent island of Mykoni.

Light.—From a lighthouse on the summit of Planumi Islet, at an elevation of 279 feet above the level of the sea, a fixed white light is exhibited, visible 12 miles.

Mykoni Channel.—When it blows hard from the northward, and the current, then strong through the Doro Channel, renders it impossible for a sailing vessel to work through, the Mykoni Channel is preferred, as the current is not so strong as in the Doro. Fast sailing vessels, having failed to pass the Doro, have succeeded in getting through the Mykoni Channel without difficulty. The Mykoni Channel is 4½ miles wide and clear of danger, but the squalls from the highland must be guarded against. In approaching the coast of Asia the water will become smoother, and a vessel will be able to work up under the lee of Khios.

Rhenea.—The island of Rhenea or Greater Delos, 10 miles eastward of Gaidaro Island of Syra, is about 4.3 miles in length north and south, 2 miles in maximum breadth, and most irregular in shape, being almost divided into two islands by a narrow isthmus; the northern and larger part is the higher, being 490 feet above the sea.

Digitized by Google

On the eastern side of the southern portion of Rhenea, opposite the larger Rematia Islet, the ground in 1843 was strewed with fragments of sarcophagi and votive altars, but the tombs had been opened and none were entire. The absence of sepulchral monuments on Delos and the quantities of sarcophagi on Rhenea is accounted for by an ancient edict forbidding either births, deaths, or burials to take place on the sacred islet of Delos, where no sacrifice which required the blood of an animal was permitted.

Rhenea has no port, except a little bay on the north coast of the southern portion of the island and eastward of the isthmus above mentioned, fit for small craft with local knowledge. It is situated about ¾ mile southward of the lazaretto. A rock which dries about 1 foot lies about 300 yards 6° from the extremity of this low point, and the passage in is on either side of it; the port is safe, but the small craft that enter it must moor.

Quarantine.—Vessels infected with the plague or other infectious diseases arriving at Grecian ports are sent to Rhenea to lie in quarantine and purify, for which purpose the lazaretto and storehouses were erected.

The lazaretto is situated upon a peninsula on the southeastern side of the northern portion of Rhenea about ½ mile from the narrowest part of the isthmus. The sanitary office is erected on the middle of the narrow neck of sand connecting the quarantine establishment with Rhenea. Close to it and on the south side of the neck is a small landing pier.

A submerged breakwater has been built in front of the pier to shelter it, its center and extremities being marked by stone pillars. Boats coming to the pier from the anchorage, after passing the rocks lying off the southern end of the lazaretto, should steer in with the western pillar in range with a conspicuous yellow house; round the pillar close-to and steer for the pier. This will keep a boat outside the rock in the center of the bay, and which can not always be distinguished.

Vessels, including naval vessels, which arrive at Rhenea to undergo quarantine are required to report themselves as soon as possible to the medical authority, who is also captain of the port, when they will be entered, quarantine commencing from that time. A Greek gunboat is usually stationed here to enforce the regulations.

Anchorage.—A fairly well protected berth for a large vessel is in from 13 to 14 fathoms, with the belfry of a small Greek church in range with the northern part of a conspicuous white building, bearing 269°. These leading marks are easily distinguished, as they are the two most southern white buildings and situated just northward of the narrow isthmus connecting the north and south portions of Rhenea Island.

Digitized by Google

Supplies.—Fresh provisions may be procured through the sanitary officer, who orders them across from Syra.

Telegraph.—Rhenea is in communication with Syra and the rest of the world by telegraph, but telegrams can only be sent four times a day, viz, 10 a. m., noon, 4, and 7 p. m. The telegraph office is at a place called St. George.

Communication.—Steamers do not call at Rhenea, but communication is maintained with Mykoni Island by sailing boat.

Miso Bay, on the southwestern side of the isthmus, affords anchorage during northerly winds in from 8 to 15 fathoms, sand.

Dangers.—In coasting these islands the salient points should not be rounded too closely. Most of the dangers can be seen and are steep-to, the principal being some sunken rocks ¼ mile off the west coast of the northern portion of Rhenea, about ¾ mile southward of Kaloyero Point, its northwestern extremity; also off the second point northward of Miso Bay. Rocks also skirt the inner part of Miso Bay and lie off the northeastern extremity of the southern part of the island. Rocks also extend from Kako and Granite Points, the north and south points of Delos, for which the chart will be a sufficient guide.

Delos, between the points last mentioned, is 2½ miles in length north and south and may average about ½ mile in breadth; Mount Cynthus, its greatest elevation about 1 mile from the northern end, is 350 feet high. At the southern end of the island is a low irregularly shaped islet nearly in range with it, the southern point of which, called Granite Point, is surrounded by rocks.

In 1896 the population of Delos consisted of 67 persons.

Delos in ancient mythology was considered to be the birthplace of Apollo and Artemis (Diana), and it was held so sacred that the islands surrounding it derived from the ancients the name of Cyclades. Capt. Brock, R. N., who assisted in the survey of these islands, in 1843, writes:

"The description of the wealth and magnificence of the buildings which formerly adorned this island is in strange contrast to the complete air of desolation which now reigns over it, but which is not the work of time so much as the hands of men. The sites of the temples which formerly embellished the seashore are now only traceable by fragments of broken columns and pieces of marble, which are daily being carried away for building purposes.

"Its lakes, fountains, and springs are dried up, and the only remains in any preservation or objects of interest are the theater and an oval basin. The theater was a splendid building, and still possesses an air of grandeur strangely at variance with the solitude and desolation around it. On the northwestern side of Mount Cynthus and about halfway up is a remarkable passage or cave, formed by

Digitized by Google

huge stones reclining and meeting each other at the top, so as to form a sort of arch which led to some subterranean chamber' probably the treasury of Delos; it now serves to shelter goats from the sun.

"Other remains, such as ancient walls, heaps of shapeless masses of marble with broken and prostrate columns, are still extant; of the latter, those immediately facing the sea lie, as if overthrown by an earthquake, side by side as they formerly stood. A trunk of a colossal marble statue (presumably Apollo), 6 feet across the shoulders, broken in two, without head, arms, or legs, still lies on the ground. The view looking down from the mouth of the cave toward Syra and over the broken and tortuous shores of Rhenea is most beautiful. The island is overgrown with brushwood on which goats feed; rabbits are very numerous, and the sides of the hills thickly dotted with their holes. An attempt has been made to cultivate a small portion of the soil, but there are only a few inhabitants, and the Mykonites are the proprietors."

Dili Strait.—Delos is separated from Rhenea by a narrow strait named Dili, having the two islets of Rematia lying in the middle, the larger islet (ancient *Hecate*) with Little Rematia 260 yards northward of it; both islets are barren and uncultivated. Opposite the southern end of the northern islet, on the shore of Delos, the remains of a circular mole are to be traced, now filled up with sand.

Owing to the deposit of material from excavations being carried on in the vicinity, a barrier is gradually being formed across the passage between Delos Island and Rematia Islet. This channel is therefore no longer available for navigation.

The larger and western passage, or that between the Rematia Islets and Rhenea, carries 5 fathoms water through it, and is often used by merchant vessels; with northerly winds a strong current sets to the southward.

Anchorage.—The best anchorage in Dili Strait is in the northern part, known as Delos Harbor, in from 9 to 12 fathoms water, good holding ground, consisting of dark sand, mud, and weed. About ¼ mile southward of Hecate Island and rather nearer to Rhenea than to Delos Island the British naval vessel *Barham*, in 1893, rode out a heavy northerly gale, the western extremity of Hecate Island bearing 355° and Mount Cynthus, Delos Island, 57°. In deeper water toward the center the holding ground is not so good. There is no danger in entering the strait from the southward, which is ½ mile wide.

Shoal.—A 3½-fathom patch lies 300 yards 29° from Dili Point, the eastern entrance point of Dili Strait.

Mykoni (Mykonos) Island is of an irregular form, the length of its greater axis in a west-southwestern and east-northeastern

Digitized by Google

direction being 8½ miles between Alogo and Euro Points, while in a north and south direction westward of Port Panormo it is nearly 6 miles across. Its greatest elevations are at the northwestern and eastern ends, where the heights are respectively 1,195 feet and 1,150 feet above the sea. The island is for the most part rocky, and huge blocks of granite are wildly strewn over the hills, the only cultivated ground being in the vicinity of the town of Kamenaki, on the western side of the island, where there are some few cornfields and vineyards; elsewhere the ground only affords pasture for a few flocks. Nevertheless, the town is prosperous, but with dirty streets, though by the aid of whitewash it looks well from seaward. There are about 30 vessels and many boats belonging to the island, and a large number of the population lead a seafaring life. By the census of 1907 the population amounted to 4,589. Numerous small churches and chapels are scattered throughout the island of Mykoni.

Light.—From a lighthouse 44 feet high, erected on Cape Armenisti, the northwestern extremity of Mykoni Island, is exhibited, at an elevation of 604 feet above the sea, a fixed and group flashing white light; visible 30 miles. It is partly obscured, but gaps in the land permit the light to be occasionally seen from the southward. (See Light List.)

Turla Bay.—The anchorage in Turla Bay is just northward of the town of Kamenaki, in 13 fathoms water, good holding ground; but vessels bound through the Mykoni Channel, and having to take shelter here in strong "meltems" or northeasterly winds, generally anchor in the northern part of the bay, in 9 or 10 fathoms, sandy bottom with patches of weeds. In rounding the northwestern end of Mykoni two small chapels will be seen, one on the point immediately southeastward of Cape Turla, the other close to the shore farther on; near these is the anchorage last mentioned.

The Korpho is, however, considered the safest anchorage; this inlet is 1 mile deep, and though open to the northwestward, vessels lie here during summer and at times lay up for the winter. Off the western point of the entrance is the little islet of St. Georgio, with a church on it, and to the northwestward of St. Georgio is another but smaller rocky islet, and between them is a depth of 5 fathoms. Extending 700 yards 203° from the latter islet and about the same distance from St. Georgio are two rocky shoals with 1 fathom water on them, difficult to distinguish.

In anchoring in the Korpho avoid the rocky shoals just mentioned, and with the inlet open, steer for the center of the low neck of sand at its head until in 13 or 12 fathoms, sand, and then anchor; small vessels can proceed nearer the head of the harbor, anchoring in 3 to 5 fathoms, the water gradually shoaling to the perfectly flat shore; if

Digitized by Google

intending to remain a short time, steady the vessel by hawsers to the shore. Large vessels should anchor farther out or northward of the town; the holding ground is good, but the water rather deep.

Light.—A fixed red light is shown, at an elevation of 23 feet, from a mast on the end of Kamenaki Breakwater, which is 360 feet long; it is visible 4 miles. (See Light List.)

Water.—On the western side of the Korpho is a small run of fresh water.

Communication.—Greek steamers call at Kamenaki from Syra and adjacent islands.

Telegraph.—The town of Kamenaki is a telegraph station.

Praso Islets.—The passage between Mykoni and Delos is obstructed by the little rocky islets of Praso.

A rock with 1 fathom of water over it lies 600 yards 113° from the southwestern Praso Islet.

When bound to or from Turla Bay care should be taken to avoid this danger, also the 1-fathom shoals off St. Georgio Islet.

With these exceptions the channel between Delos and Mykoni Islands is deep and clear.

Current.—During northerly winds the current runs strong to the southward between Praso Islets and Delos.

Port Ornos.—Port Ornos, on the southern side of Mykoni, is nearly similar in shape to the Korpho on the north, separated from it by the low neck of sand before mentioned and open to the southward; the holding ground is good, but it is only fit for small vessels. Alogo Point (the southwestern extremity of Mykoni) and the point on the eastern side of the port are both rocky and foul and should be avoided.

Santa Anna Bay is a little over 4 miles eastward of Port Ornos; the coast between is irregular, forming two or three open bays. With northerly and westerly winds there is anchorage in Santa Anna Bay a short mile north-northeastward of Cape Makrokephalo. Fronting the entrance of the bay is a small rocky low islet, which may be passed at a short distance on either side and the anchor let go in 10 or 9 fathoms, sand; farther out the bottom is rocky.

Port Panormos.—The north coast of Mykoni is rugged and irregular, and a bight called Port Panormos, a little more than ½ mile wide at the entrance, extends southward upward of 2 miles, the depth decreasing from 30 fathoms in the entrance to 5 fathoms near its head. An islet and several large rocks above water lie on the western side of entrance; the bight is completely open to the northward, there is no village, and it is seldom visited.

Euro Point.—Two large rocks above water lie about 400 yards off Euro Point, the northeastern extremity of Mykoni.

Digitized by Google

Dragonisos Islet.—Off the eastern side of Mykoni is the islet of Dragonisos, about 1¼ miles in length north and south and 585 feet high. Skirting the west coast of the islet here and there are rocks above and below water, and which also extend ¼ mile off the northern end. There is a fine cavern on the western side of the islet. The passage between Dragonisos and Mykoni is ¾ mile wide and, in mid-channel, deep and clear.

Stapodia Islet is 4 miles southeastward of Dragonisos and its southern end is 7½ miles, 92°, from Cape Makrokephalo of Mykoni. It is a narrow, irregular islet about 1,600 yards in length, with shoal ground and rocks above water, extending 29° nearly ½ mile from its northern extremity. A rock above water with a sunken danger close to it lies off its western point. Most of the dangers can be seen, but there is no need to be close to the islet.

Merminga Rock.—This isolated rock, in latitude 37° 11′ 40″ north, longitude 25° 04′ east, and about 50 feet high at its northwestern end, lies 8¼ miles, 288°, from Cape Korax, Paros Island, and 6½ miles from the nearest coast of that island. As the rock rises from, and is surrounded by, deep water, and is also a long distance from land, especial caution is necessary when in its vicinity so as to avoid it at night or in thick weather.

Paros.—This island, about 12 miles in length in a northeast and southwest direction, is rather more than 7 miles in breadth, and appears like a round mountain with two summits about ¾ mile apart, of which Mount St. Elias is 2,530 feet and Mount Koromboli 2,450 feet high. The land from these elevations slopes evenly down to the cultivated plains below, which are mainly at the northeastern and southwestern ends of the island. The soil is fertile but imperfectly cultivated, though in good seasons a large quantity of wine, barley, and wheat are produced; but there are no olives and very few other trees on the island. Sheep, goats, oxen, and asses are numerous. Parœkia, the capital, on the northwestern side, and Marmora, on the southeastern, are subject to intermittent fevers. The population of the island in 1907 was 8,491.

Paros is celebrated for its white marble quarries, which supplied material for the finest specimens of ancient Greek sculpture. These quarries are underground at the rear of Parœkia, and the marks of the instruments which the ancients used are still visible everywhere.

Port Parœkia, in the middle of the northwest coast of Paros Island, is 1.2 miles deep east and west and about ½ mile wide at the entrance, but only about half that width between the 5-fathom curve on either side. The port is open to the westward, and fronted by a chain of islets and rocks extending from the northern end of Antiparos Island.

Digitized by Google

Lights.—On Phikas Point, the northern entrance point of Port Parœkia, a fixed white light is exhibited at an elevation of 44 feet above sea, visible 4 miles. (See Light List.)

A flashing white light, unwatched, visible 8 miles, is erected on Parœkia Bank. (See Light List.)

The light is exhibited, 24 feet above high water, from an iron structure in the form of an obelisk resting on a marble column and painted white with one red band at mid height.

At mid height of the structure there is an iron balcony with balustrade.

The light is obscured by Fikas Point northward of the bearing 110° and by Kaboura Island southward of the bearing 63°.

Shoals.—On the southern side of entrance are Peponi Rocks, above water, and further in Superbe Rock, below water. In the central part of the port is a small rocky shoal with less than 1 fathom water on it, marked by a white beacon surmounted by a staff.

Directions.—St. Georgio Church in range with Krio Point on the northern side of the port, bearing 68° leads southward of the shoal ground extending from Phikas Point and northward of the rocky shoal in the central part of the port, just mentioned. In the middle of the port there are from 6 to 14 fathoms water, sand and mud, but it is not adapted for large vessels. The best berth is northward of the town.

Parœkia town, though not large nor presenting any appearance of opulence, has a pleasant aspect; it consists of neat small houses, with terraced roofs, surrounded by gardens and vines on trellises, and a population of about 2,700. The church of "Our Lady of the Hundred Gates" is a fine building, said to have been founded by the Empress Helena. Upon a rocky height on the sea side, in the center of the town, are the ruins of a castle, constructed chiefly of marble from some ancient buildings on the same spot. To the northward of the castle is the ruined church of "Our Lady of the Cross," which contains the only perfect specimen of Hellenic architecture in Paros, a semicircular apse of white marble. Fragmentary remains are in abundance.

There are two small piers on the town side of the port.

Communication.—Greek steamers call here from Syra and the adjacent islands, and there is telegraphic communication with Syra and the rest of the world.

Light.—On Cape Korax, the northern extremity of Paros on the western side of entrance to Port Naussa, from a square lighthouse 32 feet high, at an elevation of 193 feet above the sea, a fixed white light, varied by red flashes, is exhibited, visible 12 miles. (See Light List.)

Digitized by Google

Port Naussa, at the northern end of Paros, is one of the best ports in the Cyclades, and large enough to contain a large number of vessels. Its entrance is 1 mile wide between bold shores, clear of danger, and open to the northward. Immediately within, the port opens out more than 2 miles east and west, forming a bay on either side, and extends 1½ miles southwestward to a low shore at its head; the shore is bordered all round by shallow water and encumbered by islets both on the western and eastern sides.

The town of Naussa, on the south of the port, containing a population of about 1,325, is at times unhealthful.

Anchorages.—There is ample room and well-sheltered anchorage, in from 6 to 9 fathoms water, mud or sand and weeds, in the northwestern part of the port, called Yanni Bay. In entering Yanni Bay in a large vessel the northern point should be given a berth of 200 yards. Merchant vessels generally anchor southwestward of St. Artemios and St. Kali Islets, on the western side of the port, in 4 or 5 fathoms. A rocky shoal with less than 1 fathom water on it extends 375 yards 113° from the southern end of St. Artemios, the northern islet. There is also well-sheltered anchorage, in 7 fathoms, in the northeastern part of the port called Langeri Bay; but in taking this anchorage a vessel should pass southward of the ½-fathom shoal lying 300 yards 197° from Kamina Point, passing between this shoal and the northern end of Mavro Islet.

Water may be obtained, but not with a northerly wind.

Coast.—The northeastern end of Paros is surrounded by several islets, rocks, and shoals; the islets are steep-to on their seaward sides, there is nothing to take a vessel between them and the coast, and if bound into Port Naussa they should be given a fair berth, and also the rocky shoal bordering Tripetro Point at a distance of more than 100 yards, on the eastern side of the entrance to the port.

The east coast of the island is indented by several bays affording little or no shelter, but with no off-lying dangers other than those to be particularly described in connection with Naxos.

Hebreo Island—Spit.—A spit extends about 110 yards from the northeastern extremity of Hebreo Island.

Kratzi Point—Light.—A group flashing white light with green sector, unwatched, visible 12½ miles, is erected on Kratzi Point, Paros Island.

The light is exhibited, 161 feet above high water, from a white iron tower on a concrete base. This sector lights the clear channel between Chapman and Amaridi Reefs. (For sector see Light List.)

Port Trio, on the southeastern side of Paros, is formed between two slightly projecting points of the coast called Capes Khiuni and Pyrgo, the island of Trio on the southeast, and the islets of Makro

Digitized by Google

and Praso, which partly protect it on the east. The island of Trio is triangularly shaped, its sides being about ½ mile in length and 1,300 yards from the shore; the space between affords good summer anchorage, but is exposed to southwest and southerly winds, which cause a considerable swell, and it is therefore unsafe in winter. Vessels may anchor where convenient, but the best berth is rather nearer the island of Trio than Paros, in 7 or 8 fathoms water, sand and weeds.

Water.—The watering place at Trio Point midway between Capes Khiuni and Pyrgo will be known by the houses, and a vessel may obtain a plentiful supply. Near the place where the boats should anchor are several rocks, which circumstance renders watering difficult with southwest and southerly winds when a sea sets in. With a canvas hose about 60 yards in length, 90 tons of water may be obtained in 12 hours with sufficient boats and under favorable circumstances.

Makro.—The islet of Makro lies north and south 600 yards in length, with some small islets or rocks at the north end from which shoal ground extends a long 200 yards northward, leaving 7 or 8 fathoms water in the narrow space between it and Praso Islet, farther north. Shallow rocky ground extends 250 yards southward from Makro Islet.

Directions.—With a leading wind and under favorable circumstances, a vessel may pass out between Praso and the coast, by keeping about 200 yards from the islet, into the channel between Paros and Naxos. In going out between Trio and Makro Islets the shoal extending 200 yards northward of the former and the rocky ground extending southward of the latter must be avoided.

Antiparos is 7 miles in length north and south, including the islets at the northern end, with an extreme breadth of 2¾ miles, and its most elevated part, said to be a solid block of narble, is 1,010 feet above the sea; it produces a little corn and wine, and with fishing the population, who in 1896 numbered 596 and lived chiefly in the village of Kastro, manage to support themselves. The village stands on a ridge about 1,400 yards from the northern end of Antiparos, and from it the time to the grotto on a donkey is 1½ hours.

A small quantity (250 tons) of zinc ore (calcined calamine) was shipped from this island in 1898.

Port Despotiko (Episkopi).—This snug little anchorage, on the southwestern side of Antiparos and nearly 2½ miles from Cape Petalitha, the southern extremity of the island, is sheltered from all but southerly winds; the port is about 1 mile in length, 800 yards wide at the entrance, and from 10 to 2 fathoms deep. The only interest here is the celebrated grotto, to reach which, land on the northern shore of the port about 500 yards to the southeast of the few scattered houses seen on the shore, cross the hill in a north-

Digitized by Google

easterly direction, and after reaching the summit the entrance of the grotto will be observed. On the side of a distant hill to the northeastward it shows as a large and distinct dark blotch on the side of the hill, about ¾ from the top. The grotto is reached after 2½ hours' easy walking and climbing.

Despotiko Island, which forms the western side of the port, is 2¾ miles in length east and west, about 1 mile in average breadth, and its highest part, Mount Kudro, rises 640 feet above the sea, over the bold cliffy head of the same name on the south.

Strongylo (Strongyli) Island.—Westward of Despotiko and separated from it by a channel 900 yards wide, with 14 fathoms water in the middle, is the bold rugged island of Strongylo, 615 feet high; both these islands are barren, without inhabitants, and their south coasts steep-to.

Kalika Rocks are two patches, with 2½ fathoms water on each, lying about 1,600 yards 352°, and 1.1 miles from the northern end of Strongylo; between the patches there are from 5 to 13 fathoms water. The boat passage between Despotiko and the islet northeastward of it kept open of Kalika Point, the northern extremity of Despotiko, bearing 98° leads northward of the rocks; the western side of Strongylo bearing eastward of 175° will lead westward of Kalika Rocks.

Antiparos Strait is formed between the islands of Antiparos and Paros. The entrance on the south between the southern extremities of Paros and Antiparos is 5½ miles wide, but contracted by a chain of islets, rocks, and shoals, which lie mainly off the coast of Paros; the outer and largest of these islets is named Pandros, and the inner, 1½ miles to the north-northwest, is called Turna. The passage east of these islets has depths of from 6 to 20 fathoms and westward 8 to 30 fathoms.

Anchorage.—There is temporary anchorage during fine weather in summer for visiting the grotto of Antiparos, a little northward of Akako Point, in from 9 to 12 fathoms. Landing will be found in the little sandy bay westward of the point, from which the grotto is distant about ¾ mile. A rugged path will be seen or a guide found.

Anavadi Rock.—At 1,100 yards 330° from Turna Islet and rather more than that distance 91° from Glipho Point (Antiparos) is Anavadi Rock, with less than 1 fathom water on it and 5 fathoms around. Anavadi Rock will be avoided by keeping about ¼ mile from Glipho Point.

Petalitha Rock is situated 400 yards from the eastern side of Antiparos Island and 1,800 yards to the northward of Cape Petalitha. The sunken rock lying about 200 yards northeastward of this islet is at times 1 foot above water; when this is the case, there will be less water in the strait to the northward than marked on the chart.

Digitized by Google

Fourteen-foot Pass.—The northern end of Antiparos Strait, between Paros and Antiparos, is only about 900 yards across, and encumbered with islets, rocks, and shoals, leaving a very narrow channel carrying 14 feet water on the Antiparos side of Budaria Islet, called the Fourteen-foot Pass of Kastro.

The eastern point of the little islet of Oro, in range with the western cliff of Turlo Rock (which is remarkable, being somewhat like a square tower), and bearing about 358°, leads through the pass, but it is so very contracted and dangerous that it is unadvisable to take it unless under favorable circumstances and in cases of necessity, when the chart and eye must be the guide.

From the northern end of Antiparos Island another chain of islets, rocks, and shoals extends 3 miles north-northeastward, which terminate in the Portis, two small islets or rocks, steep-to, and 1.3 miles from the shore of Phikas Point, on northern side of entrance to Port Parœkia.

The Buves.—Between the Portis and Spiridioni Rocks, 1.1 miles to the southward, are the Buves, three of which are above water with sunken rocks around them, one of the latter being 450 yards southwestward of the southern dry rock. The passage between Spiridioni Rocks and Turlo Rock on the south is ½ mile wide, with 15 fathoms in mid-channel. The Skala, ½ mile eastward of Spiridioni Rocks and 700 yards from the shore of Paros, is surrounded by shoal water and should be given a berth.

Temporary anchorage.—There is temporary anchorage for small vessels during summer, in 5 or 6 fathoms water, sheltered from all but northeasterly winds, in the bight formed by Kabura and Diplo Islets, and north of Oro. The two former are the largest of the islets extending northward from Antiparos and nearest to that island.

The above islets and rocks cover the approach from the westward to Port Parœkia and the Fourteen-foot Pass of Kastro; the passages between them are deep, and when taken the chart and the eye must be the guide, but from the westward for Port Parœkia the safest way is to pass northward of all.

Naxos (ancient *Naxia*), one of the large islands of the Cyclades, being 18 miles in length north and south, with an extreme breadth of 12 miles, is mountainous throughout its length; the highest summit, Mount Zia, is 3,290 feet, and Mount Korono, about one-fourth from the northern end, is 3,250 feet above the sea. Besides the capital, the island contains 38 villages; the entire population in 1907 amounted to about 16,694, nearly all Greeks.

Productions.—Naxos contains granite, serpentine, and marbles scarcely inferior to those of Paros; groves of olive, orange, cedar, pomegranate, fig, and lemon trees abound in the well-watered valleys, and a large quantity of fruit, oil, corn, and wine is exported; a white

Digitized by Google

wine it produces is in especial repute. Emery is found in large quantity, especially in the southern parts of the island.

Naxia Bay, on the western side of Naxos, is semicircular, more than 1½ miles wide, about ¾ mile deep, and open to the northward. Mungri Point, on the southern side of the entrance to the bay, has a large rock off it above water and is surrounded by shoal ground; at about 800 yards southward of the point Mount Strongylo rises to a height of 500 feet.

The south shore of Naxia Bay is low, broken, and skirted by rocks and shallow water; the sea runs into a large salt lagoon on the south, and eastward of the lagoon is the plain of Naxia.

The islet of Bacchus, about 200 yards in diameter, lies close off the northern point of the bay and nearly connected to it. The ancient name of the islet was *Palæti;* it derived its modern name from the ruins of a temple of Bacchus, of which only the western portion now remains. The massive proportions have an appearance of remote antiquity; the portal consists of three huge marble slabs, two standing erect on basements and one laid across on the top.

From Bacchus Islet to the southern part of the town the shore is fronted by broken shallow rocky ground, and near the northern part of the town, below the surface of the water, are the remains of an ancient massive mole; within it there is a depth of 3 to 4 feet.

Harbor works.—Important harbor works have been commenced in the port of Naxia. A mole to be 460 yards in length will run from Bacchus Island to the southwest, and another jetty to be 132 yards long will extend toward the northwest from the point to the westward of St. George's Church. Bacchus Island is now joined to the coast by a jetty on which railroad lines are placed.

The quay of the port has undergone important modifications, and others are projected. The depths of the port have been increased.

NOTE (1915).—These works are for the present suspended, and the ends of moles are unmarked by lights. The construction of the southern mole has made hardly any progress. The mole which is projected to extend southwestward from Bacchus Island has made hardly any progress, and the small jetty at the southern point is scarcely commenced.

There are no lights on these jetties.

Depth is found everywhere in the port, but the submerged prolongation of the old inner jetty should be avoided.

Guardian Rock.—At 700 yards 6° from Mungri Point is Guardian Rock, above water with rocky ground round it, and 150 yards 344° from the rock is a rocky patch with 1½ fathoms water on it. Between Guardian Rock and Mungri Point there are from 7 to 11 fathoms water.

Digitized by Google

Anchorage.—The usual anchorage is about ½ mile westward of the town, in 6 or 7 fathoms, sand and weeds; farther westward the water deepens rather suddenly. A swell nearly always sets into the bay, and the anchorage is not considered as safe as Procopi Bay, farther southward.

Shoal.—A patch of 26 feet is reported to lie about 600 yards 243° from Bacchus Island, but the position is doubtful.

Naxia town.—The town of Naxia, on the northern point of the bay, occupies the site of the ancient town, with a population of about 2,000; the white houses rise from the shore one above the other on a conical hill and afford a pleasing aspect from seaward, though the streets are narrow, intricate, and dirty. An ancient ducal palace is in ruins, and northward of the town is the fountain of Ariadne, a small rill.

Telegraph.—Naxia is a telegraph station.

Amaridi Rocks.—Naxos Island is separated from Paros Island by a channel 2.6 miles wide, having between the rocks about to be described and Paros Island a depth of 17 fathoms. Amaridi Rocks are a dangerous low ledge of rocks with shoal water, the whole, under the depth of 5 fathoms, occupying a space of ½ mile in a north-north-eastward and south-southwestward direction, and lying in mid-channel. The highest rock lies 1.9 miles 88° from Krazi Point, Paros; 1.7 miles 279° 30′ from Aspro Rock; and 1.7 miles 209° from Procopi Point, Naxos. These rocks are seen from some distance, and the sea at times breaks heavily over them. A 7-fathom patch lies 195° nearly ½ mile from the southern Amaridi Dry Rock.

Chapman Rock.—A little westward of the line joining Amaridi Rocks and Procopi Point and 1,200 yards from the latter is a rock with less than 1 fathom water over it, called Chapman Rock. To avoid these dangers at night keep the coast of Paros aboard.

Wreck (1914).—The wreck of a steamer lies on Chapman Rock, in (approximately) latitude 37° 03′ 50″ north, longitude 25° 20′ 10″ east.

Procopi Bay.—Procopi Point is the western extremity of Naxos, and on its southern side is Procopi Bay, which affords good anchorage with all northerly winds in 6 or 7 fathoms, sand and weeds. A rocky bank, with 4 to 5 fathoms water on it, lies 400 yards southward of the point, leaving between a depth of 6 fathoms.

Shoals.—St. Nikolaos Church is situated upon the southeastern point of Procopi Bay, and 600 yards 218° from this church is a rock with less than 1 fathom water over it.

A 4-fathom patch lies ½ mile 245° from the same.

Aspro and Laro Rocks.—From St. Nikolaos Church Point the shore southeastward is bordered by a bank, with scattered rocks here and there, which extend off nearly ½ mile. Aspro Rock, 1 mile 186°

Digitized by Google

from the point and nearly ¾ mile from the shore, is about 200 yards in diameter, and rises 280 feet above the sea, from the center of a rocky shoal 700 yards in extent east and west under the depth of 5 fathoms. Between the shoal and the shore bank there are 6 fathoms water. At about 400 yards southeastward of Aspro Rock are Laro Rocks, a cluster above water and 400 yards in extent, with 8 fathoms water between them and Aspro Rock.

Cape Parthenos projects from the low shore about 1½ miles south-southeastward of Aspro Rock, and is surrounded by shallow water and rocks; off it are two or three little islets. Although these islets and rocks are generally steep-to, they should be avoided.

Anchorage.—At 2½ miles south-southeastward of Cape Parthenos is Loannis Point, surrounded at a distance of about 600 yards, by shallow rocky ground; and at ¾ mile farther on is Kurupa Point projecting to the south, with a small chapel on it. Good anchorage will be found at a short ½ mile eastward of this latter point, sheltered from all northerly winds, in 9 fathoms water, sand, and weeds. Also, similar anchorage off a little bay a little more than 1 mile eastward of the above. A little islet called Black Rock, with shallow water around it, lies about 1,400 yards from the shore, at 1¾ miles southeastward of Kurupa Point.

Reported shoal.—Cape Katomeri is the southern extremity of Naxos Island, and 1 mile northwestward of the cape is Baitani Point 1,600 yards 271° from which is the reported position of a shoal with 2¼ fathoms on it.

Current.—During northeasterly winds, or in calms, the current between Paros and Naxos sets to the southward about 1½ knots an hour, but with westerly winds it sets 1 knot an hour to the northward. Also between Naxos and the group of isles on the southeast the current is similarly affected, setting through the channels to the southwest and south with northeasterly winds and in clams, at the rate of 1½ knots an hour, and with westerly winds to the northeast and north 1 knot an hour.

South coast of Naxos.—The coast from Cape Katomeri, eastward to Cape Panermo, a distance of a little over 5 miles, is bold and irregular, forming several little bays; there are no other offlying dangers excepting Delo Rocks, and the water is all along deep. There is temporary anchorage during fine weather in the little bay of Kalando, about 1½ miles northeastward of Cape Katomeri.

Delo Rocks.—This dangerous bed of sunken rocks, on the south coast of Naxos, is about 700 yards in extent in a northwest and southeast direction, and lies a short ½ mile southwestward of the headland forming the western side of entrance, and in front of the little bay of Panermo. On this bank are two rocks with less than 1 fathom water on them, lying 336° and 156° 400 yards from each

Digitized by Google

other, the inner rock being 700 and the outer 1,000 yards from the shore. The latter bears 243° and is distant 1,800 yards from the southeastern extremity of Cape Panermo. Between this bed of sunken rocks and the shore there are from 6 to 17 fathoms water.

East coast.—From Cape Panermo the bold eastern coast of Naxos trends northward nearly straight for 8 miles to Cape Mutsoma, a prominent headland projecting eastward about ¾ mile from the general line of coast, and having a large rock at its extremity.

Anchorage.—In the bight called Mutsoma Bay, on the southern side of the cape, there is anchorage with all offshore winds.

Cape Stauro, the northern extremity of Naxos, is 8 miles from Cape Mutsoma. The coast between is slightly irregular, with one or two little bays, and the spurs of the hills projecting from Mount Korono, which at 3.3 miles inland, is 3,250 feet high; the water is all along deep, with 45 fathoms at 400 yards northward of Cape Stauro. At Apollona Bay, 1½ miles southeastward of Cape Stauro, is an unfinished colossal statue, lying in an ancient marble quarry; it is roughly hewn, and 31 feet from head to feet. The natives have always identified it with a statue of Apollo.

Makariœ Isles.—These three rocky islets lie directly eastward of Cape Mutsoma; the two northern, St. Nikolo and Prasini, are nearly connected, having only 1 fathom water between them. Strongylo, the southern islet, is ¼ mile from Prasini, and between there are from 10 to 20 fathoms. St. Nikolo, the largest of these islets, is irregular in shape, and nearly 1 mile in extent; the two smaller are each ½ mile in length. The water is everywhere deep about them, and the passage between them and Cape Mutsoma is 3½ miles wide, and from 20 to 47 fathoms deep.

Kopria Islet.—The little islet of Kopria, about 700 yards in extent east and west, with deep water all round it, lies 5¾ miles southwestward of Strongylo and 2¼ miles northeastward of Apano-Kupho, mentioned in the next paragraph.

Heraklia and Kupho Islets.—Southeastward of Naxos are several barren rocky islets; the principal, beginning from the southwest, are Heraklia, Echinosa, Kato-Kupho, Apano-Kupho, Karos, Drima, and Antikaros, besides which there are several smaller, forming altogether a group of 23 islands and islets. The islands have a total population of about 2,000. Traces of ancient buildings have been found on some of them. They extend 15 miles in an east and west direction, and are separated from Naxos by a passage 2 miles wide, which, with the exception of Delo Rocks, described above, is clear and deep.

Kato-Kupho and Apano-Kupho are only about 300 yards apart; in the channel between the depths are 3 to 4½ fathoms. In the bight which they form on the southeast there is temporary anchorage in

Digitized by Google

6 to 8 fathoms water, sandy bottom, but exposed to winds between northeast and southeast. The water about these islets is generally deep and free from danger.

Denusa Island (ancient *Lelandros*) is an irregularly formed islet about 3 miles in diameter and 1,605 feet high. On its northeastern side is Rusa Bay, with a cove at its head, and on the northern side of the bay is the little islet of Trigono, which shelters the cove from the northeastward; the islet is connected to Denusa by a shoal with 4 fathoms water on it. Off the point, between Cape Kalota and Aspron Point, the northern and western extremities, respectively, are some rocks showing above water; on the south coast are two or three little bays. There is a population of about 136. Between Denusa and the Makariœ Isles the water is deep and the passage nearly 4 miles wide.

Buey (Melanti) Rock.—This isolated little islet or rock, situated in lat. 37° 14½′ N., long. 25° 56′ E., is only 350 yards in length in a northwest and southeast direction, about 180 feet high, pyramidal in shape, bold and rugged, and surrounded by a narrow bank; rocks above and below water extend off more than 100 yards from its eastern end, off which, at the distance of 200 yards from the shore, there are from 20 to 45 fathoms. Buey Rock lies 7½ miles northeastward of Denusa, and 17 miles 92° nearly from Cape Papas, the southwestern extremity of Nikaria.

Amorgos Island is 18 miles in length east-northeastward and west-southwestward with an irregular coast line, its breadth being from 1 to 3 miles. It is mountainous throughout, the greatest elevation being at the northeastern end, where Mount Krikelos is 2,560 feet high; Mount Elias, in the middle, is 2,175 feet, and Mount Korax, at the southwestern end, 1,890 feet high. The island is tolerably well cultivated, and there are places of some beauty in the narrow valleys which intersect the hills; the soil produces corn, oil, figs, tobacco, and cotton, all of good quality, and there is a manufactory of earthenware. There were three ancient towns, all on the northwestern side of the island, and there are still vestiges of buildings, sculptures, pillars, etc., proving them to have been of some consequence in former days.

There are two good anchorages, Port Vathy and Kaloterion Bay, both on the northwestern side of the island, and three villages, besides the scattered houses on the beach at Port Vathy and St. Anna Bay, containing altogether in 1907 a population of about 2,627.

Gravusa Islet, at its western end, is separated from Antikaros, the southeastern islet of the Heraklia and Kupho group, already alluded to, by a deep, clear passage, 2.6 miles wide.

Port Vathy, on the northwestern side of Amorgos Island, and 4¼ miles from Gravusa Islet, is a safe little port, although the squalls in

Digitized by Google

northeasterly gales are very heavy, but the holding ground is soft mud, and vessels ride in safety. There is no danger in entering, as the shore is steep-to all around. The Austrian naval vessel *Spalato* was at Port Vathy in 1897, and her captain reports that his vessel, 328 feet long, had not swinging room at single anchor. He also reports that two windmills in range make a good leading mark in; the front mill being situated close to the shore, and the other in ruins standing on higher ground about 109 yards eastward of the former. The village of Katapola is on the southern side and in 1896 had a population of 110; there are also blocks of houses on the northern and eastern sides. On a hill southward of the port and overlooking it are some few remains of buildings; and on Kastri Point, about 2 miles southwestward of the port, is a ruined fort.

Light.—On Cape Elias, the northern entrance point of Port Vathy, at 66 yards from the shore, is a square stone tower, 34 feet high, from which is exhibited a fixed red light, elevated 132 feet above the sea, and visible 6 miles. (See Light List.)

Supplies.—A few provisions may be had, and a supply of good drinking water may be procured by boats from a fountain close to the health office.

Communication.—Greek steamers from Syra and adjacent islands call here. It is also a telegraph station.

Kastron (Khora), the principal village or town, stands on a hill about 1½ miles eastward of Port Vathy, and is clustered around an old ruined Venetian tower. It contains a population of about 1,000.

Kaloterion Bay.—Nikuria Island, 3.8 miles northeastward of Cape Elias, is 2¼ miles in length, rather more than ½ mile in extreme breadth, and at about one-third from its western end rises abruptly 1,140 feet above the sea; its east end is connected to Amorgos by shallow ground. Lying somewhat obliquely to Amorgos, the island forms with it on the south Kaloterion Bay, where a vessel may anchor as convenient, southward of a little church, in 18 to 20 fathoms, good holding ground. For a sailing vessel it is almost necessary to have a fair wind to enter, as the bay is subject to calms, squalls, and variable winds.

The bay is nearly 1 mile wide between Atimo Islet, 276 feet high, and the shore of Amorgos; Atimo is separated from Nikuria on the north by a narrow, deep channel.

Shoal.—A small rocky patch with 5 fathoms on, and deep water around it, lies in the center of the bay, and bears 108°, 1,600 yards from the southern extremity of Atimo Islet.

St. Anna Bay, northeastward of Nikuria Island, is ¾ mile deep, and nearly ½ mile wide at its head, where there is a sandy beach and a village consisting of a few scattered houses. The bay is open

Digitized by Google

to the westward, and the water deep, but if necessary a vessel might anchor in the northeastern corner. There is a mooring buoy for small craft to make fast to.

The village or town of Landada contains a population of about 700, is on the hill 1 mile eastward of the bay, and that of Tholari, with a population of about 400, nearly 1 mile to the northwestward.

Water.—A good stream of water runs into the bay.

North Coast.—From St. Anna Bay, the coast to Cape Prosino, the eastern extremity of Amorgos, is high and bold, with deep water; between the bay and Cape Villakarda, the northern extremity of the island, there are two little inlets. Nearly 800 yards from the coast, and about 1¼ miles northeastward of Cape Langada, is a large rock or islet 30 feet above water, with depths of 54 fathoms around it.

Southeast coast.—The southeast coast of Amorgos consists principally of high cliffs, from which, during northerly gales, the wind rushes down in heavy squalls, lashing the water into foam, and rendering it necessary for sailing vessels passing to give this side of the island a wide berth; there is no anchorage or shelter, The surface of the island is broken into detached rocky peaks, with cultivated valleys between them.

At Panagia, a hill 1,080 feet high, midway along the southeast coast, and ½ mile eastward of the village of Kastron, is a monastery, built in the mouth of a cavern on the face of the cliffs; it was built thus to secure it from the attacks of pirates, by whom these islands were formerly visited.

Gravusa Islet.—At the western end of Amorgos are several small islets or rocks. One of these, Gravusa, before alluded to, 1 mile in length north and south, is irregular in shape, and separated from the coast by a narrow passage which is yet further contracted by rocky ground around the southern end of Gravusa. Temporary anchorage may be had on the western side of Gravusa, in from 10 to 13 fathoms, ¼ mile from the shore.

Cape Kalotari.—In the nook on the eastern side of Cape Kalotari, the western extremity of Amorgos, is a little port fit for coasters, having 10 fathoms water at the entrance and 3 fathoms 150 yards from the beach.

Petalidi.—At about 2½ miles northeastward is the islet of Petalidi, with shoal water extending 300 yards. It shelters on the south the small narrow port of Akrotiri, an inlet ½ mile deep. A small vessel might anchor here, but a sailing vessel would have difficulty in getting out.

Liadi Islets.—Nearly 4 miles eastward of Cape Prosino (Krikelos) are the Liadi Islets, four in number, large and small, which extend nearly 1 mile north and south. The northern is the largest and 200 feet high, barren and unproductive; the southern is low and flat,

Digitized by Google

and the shoal which connects them extends westward about ¼ mile. The Liadi Islets belong to Greece.

Current.—The current between these islets and Amorgos sets to the southeastward, rarely less than ¾ knot an hour, but stronger according to the force of the northeasterly wind.

Polykandro (Pholegandros).—The passage between this island and Polino eastward of Milo is 10 miles wide, clear and deep. Polykandro is 7 miles in length northwest and southeast, the northern part being about 1½ miles in breadth and 1,022 feet high, the southern part 2¼ miles in breadth and 1,363 feet high. The island is contracted in the middle to a breadth of ½ mile. The population in 1907 was 962. It is well cultivated, and produces corn, cotton, a little wine, rears sheep, and abounds in game. The modern town contains a population of about 600, is at the foot of the hill on which the ancient city stood, and about 1½ miles northwestward from Port Karavostasi.

Port Karavostasi.—There is no good harbor in the island, only a small cove about 400 yards wide with a beach, called Port Karavostasi, at the eastern end of the island. In the vicinity of the cove there are two or three little islets or rocks near the shore.

Light.—On the northern entrance point of Port Karavostasi is erected an iron standard, 26 feet high, from which is exhibited a fixed red light, elevated 53 feet above the sea. (See Light List.)

Communication.—Port Karavostasi is a telegraph station. Greek steamers call here from Syra and adjacent islands.

The coast of Polykandro is high and iron-bound, more especially the southeastern part, with rocks scattered here and there close to the shore, but no off-lying dangers. A bay called Port Vathy, on the southwestern side of the island, is entirely open, with deep water until within ½ mile of its head.

Adelphia Rocks.—At 5.3 miles to the eastward of Polykandro is the southwestern end of Sikinos, and between the two is a chain of rocks or islets. The western group, Adelphia Rocks, 800 yards in length, consists of two islets connected by a reef; the eastern islet is 306 feet high and the western 179 feet.

Shoal.—A shoal with 2½ fathoms on, and deep water around it, lies 600 yards 310° from a large rock at the northern point of the eastern Adelphia Rock.

Kardiotissa, the central and largest islet of the chain, is nearly 1¼ miles in length in an east and west direction and 505 feet high. The western end is bordered by a bank extending 200 yards from the shore, with which exception the water is deep all around the islet. Over the central point on the south coast is a church.

Kaloyeros and Karavos are united by a reef, and shoal water surrounds the islets, except on the southeastern side. These two

Digitized by Google

islets are the easternmost of the chain, and lie between Kardiotissa and Sikinos, 700 yards from the latter, with deep water between.

Shoal.—A shoal, with 23 feet water over it, lies nearly in mid-channel between Kardiotissa and Karavos, bearing 257°, 650 yards from the latter; it is indicated by a sudden change in the color of the water, and extends about 220 yards in a northeasterly and southwesterly direction.

With the exception of the shoals mentioned, the water is deep between and around these islets, and a vessel may pass in mid-channel between them.

Sikinos Island is 7½ miles in length in a northeasterly and southwesterly direction, with an average breadth of about 2 miles. The island in places is rocky and barren, but other parts produce wheat, figs, and wine. It has no port, but the skala or landing place is about midway on the southeastern side, in a cove with a beach, where boats are hauled up.

Light.—A fixed red light is shown at an elevation of 85 feet from the eastern point of Skala Bay. (See Light List.)

Sikinos village stands on an elevated ridge about an hour's walk from the skala, and contains the whole population of the island, amounting to about 627. The remains of the ancient Sikinos, consisting of some foundations and fragments, occupy an abrupt cliff westward of the ridge. A little farther in the same direction is a small temple of Apollo, of bluish marble in good preservation, now used as a Greek Church, and supposed to have been built about the second or third century B. C. The water all round the island at the distance of ¼ mile is deep.

Telegraph.—The village of Sikinos is a telegraph station.

Nio (Ios) Island, the reputed burial place of Homer, is separated from Sikinos by a clear and deep channel nearly 3 miles wide, is 9¾ miles in length in a north-northwest and south-southeast direction, with an average breadth of 4 miles. Nio is rocky and mountainous, with a granitic base and calcereous summits, its greatest elevation being 2,410 feet above the sea. It has a softer and more genial aspect than Polykandro or Sikinos, and produces cotton, oil, wine, and a small quantity of corn. The coast is indented with several bays, and on the western side is the port and town of Nio. The population of the island in 1907 was 2,090.

Port Nio (Ios), open to the southward, is nearly 1 mile deep and ¼ mile wide, shoaling from 20 fathoms water at the entrance to 5 fathoms at about 200 yards from the low shore at its head. The town, containing nearly all the population of the island, occupies part of a small hill about ½ mile inland, rising from the eastern side at the head of the port; it is the site of the ancient city of which some

Digitized by Google

foundations are still visible and a zigzag paved road leads to it from the skala.

Light.—A fixed white light is shown on a turret over a white hut, situated about 130 feet from the extremity of Cape Phanari, the western entrance point of Port Nio; visible 5 miles.

Shoals.—The eastern point of entrance to the port, Cape Exeris, is surrounded by rocks, which extend off more than 100 yards, and a rock awash lies nearly 200 yards from the shore, ¼ mile to the northwestward of Cape Phanari.

Telegraph.—Port Nio is a telegraph station.

Manganari Bay.—Temporary anchorage may be found with all northerly winds in Manganari Bay at the southern end of Nio Island, in from 10 to 15 fathoms water, over sand.

Coast.—A little islet or rock will be observed here and there close to the shore, but there are no off-lying dangers, and the coast may be approached to a reasonable distance.

The passage between Petaleitha-nisi, at the northern end of Nio, and Avelos Rock, off the western end of Heraklia to the northeastward is 4½ miles wide, clear and deep.

Anedro (Anhydron).—This little island is uninhabited, and lies in a central position between Nio, Amorgos, Santorin, Anaphi, and Stamphalia, being 9 miles to the southwestward of Amorgos, the nearest land. Near its southeastern end is a conical rock, and to the southwest of the island is a rock awash.

Santorin (Thera).—This island in early times was inhabited by the Phœnicians, and known by the name of Calliste or The Beautiful Isle; subsequently it was colonized under Theras from Sparta, after whom it was named. The modern name Santorin is derived from the Greeks. The island was originally circular, but it is now more in the shape of a crescent, Therasia Island and Aspro Islet on the west having been separated from it by an earthquake about B. C. 237. The half-moon interior is the crater of a submarine volcano, and in places is upward of 200 fathoms deep. In the middle of the crater are three islets thrown up by volcanic agency, of which the largest, Neo Kaimeni or New Burnt Isle, a mass of cinders and lava, now 438 feet above the sea, originally appeared in 1707, but was largely added to by the last eruption in 1866. On the northeast side of this islet is Mikro Kaimeni or Little Burnt Isle; on the southwest is Paleo Kaimeni or Old Burnt Isle, 320 feet high, which emerged B.C. 197.

Santorin Island extends 9 miles in a north-and-south direction; in no part is it more than 3 miles in breadth, which decreases near the northern and southern extremities to about 1,400 yards. The shores round the inner curve are the edges of the crater, and the dark rocky precipices, varying in height from about 500 to 1,000 feet, have a dismal though interesting and picturesque appearance, and form a

Digitized by Google

precipitous slope at an angle of 45°. It is along the edges of these precipices that the principal towns are built—Epanomeria at the northwestern horn, Merovuli and Thera, the capital, in the center of the curve. At Skaro, near Merovuli on the overhanging cliffs, is a ruined Venetian fortress. The houses perched along the edges of the cliffs present a strange aspect, and most of them throughout the island are partly excavated in the porous rock.

The population is about 14,300. They are honest, industrious, and much attached to their volcanic island. There are several vessels and small craft belonging to the island, which find shelter in the creeks of Kaimeni. There are two landing places; one below the capital town of Thera, the other at Athenous Bay, 2 miles farther south, each with a steep ascent up the cliffs.

Aspect.—The northern half of the island is composed of volcanic material, iron, pumice, lava, etc., and three remarkable mountains occupy the space between Meronuli and the village of Phinika, about 1 mile eastward of Epanomeria. In the southern part, where the island is broadest, Mount Elias, a conical peak and the highest point of the island, rises 1,887 feet above the sea. On the east side of the mount is a ridge called Sellada, by which Mount Elias is united to Messa Vuno (half mountain), probably so called from its being a little more than half the size of the former. Messa Vuno is a precipitous mass, on which are the remains of the ancient city of Thera, and it terminates at the southeastern extremity of the island in Cape Messa Vuno.

Productions, etc.—The soil of Santorin, of decomposed pumice-stone, is fertile and carefully cultivated, more especially in the south and southeastern districts of the island, rendering it well worthy, even at this day, of its ancient name Calliste. It produces a little corn and cotton, and an abundance of wine of some strength, which with age becomes good and is exported. Water and firewood are scarce, and the inhabitants are at times obliged to procure the former from Nio or Amorgos.

Communication.—Steamers from Syra and the principal islands of the Cyclades call at Thera. There is telegraphic communication with the rest of the world, the telegraph office being at the village of Epanomeria or Oia.

Light.—A fixed red light is exhibited, at an elevation of 378 feet, from a square masonry tower, 26 feet high, at Epanomeria, on the southwest point of the northern horn of Santorin; it is visible 8 miles. The light may at times appear quick flashing, on account of the sails of a windmill (when working) situated about 21 yards westward of the lighthouse. It is partially obscured by the mill when within 3½ miles from the light. (For obscured sector see Light List and Charts.)

Digitized by Google

Therasia.—On the western side of the crater is the island of Therasia and the islet of Aspro, each separated from Santorin by the eruption B. C. 237. Therasia is rather more than 3 miles in length north and south, about 1 mile in breadth, and the eastern coast rises nearly perpendicularly to about the height of 936 feet, agreeing exactly in strata and elevation with that of Thera opposite; but the land slopes rapidly to the west, where the shore is comparatively low. The soil produces cotton and grapes. There are four villages on the island, the largest, Manola, with a population of about 400, being situated on top of the cliffs on the east coast. The population of the whole island is about 855.

The island is separated from the northwestern end of Santorin by a passage 1,700 yards wide; but its northern part is bordered by shallow rocky ground, and a rocky shoal with less than ½ fathom water on it lies 600 yards eastward of Cape Riva, the northern extremity of Therasia Island; a reef also extends from Tino Point, the next point southeastward of Cape Riva. The north and west coasts of the northern end of Santorin are also bordered by shallow water, but in mid-channel between the two islands the depth is 195 fathoms.

Mansell Reef.—The little islet or rock of Kimina lies close off the southwestern point of Therasia, and at ¾ mile 181° from Kimina is Mansell Reef, the crown of which is about 300 yards in diameter, with 1½ fathoms water on it. There are 3 and 4 fathoms close round the reef, a patch of 5 fathoms 300 yards southward of it, and 23 and 25 fathoms at ½ mile westward; a little more than 200 yards eastward of the reef the water deepens to 125 fathoms.

A vessel should give this danger a wide berth, and not approach its western side into less than 15 fathoms water. The northern extremity of Neo Kaimeni, well open of Cape Tripiti (the southeastern extremity of Therasia), bearing 75° leads southward of Mansell Reef.

Aspro Islet, so called from the white appearance of its summit, is on the inner edge of the bank fronting the southern entrance to Santorin, and nearly midway between Therasia and Cape Akrotirion, the southern horn of Santorin. Aspiro is less than 800 yards in length, about 300 feet high, and surrounded by rocky shoal ground extending 400 yards northward and 600 yards to the southward. A patch with 2½ fathoms on it also lies nearly 400 yards southeastward of the eastern extremity of Aspiro Islet. The islet being on the brink of the crater, the water between it and Therasia and toward the Kaimeni is deep; but the bank from islet to Cape Akrotirion has from 6 to 12 fathoms water on it, sand, or sand and weeds.

Aspro Islet anchorage.—Temporary anchorage during fine weather will be found about 600 yards southwestward of Aspro Islet, in 9 or 10 fathoms water, sand and weeds.

Digitized by Google

Cape Akrotirion, the southwestern extremity of Santorin, is bordered by a rocky bank whih extends off about 200 yards. Inside the crater, at about 1.3 miles northeastward of the cape, are some rocks, covered and uncovered, extending nearly 400 yards from the shore, but they are out of the track of vessels.

The land immediately over the steep cliffs of the cape is 373 feet high, and rises at 1¾ miles eastward to a hill 600 feet above the sea.

Light.—A flashing white light is shown at an elevation of 321 feet from a square tower 380 yards eastward of the extremity of Cape Akrotirion; visible 22 miles. (See Light List.)

Anchorage Bank.—Vessels may bring up eastward of Mikro Kaimeni, on Anchorage Bank, in 5½ fathoms, but its area is small, being only about 340 yards across, and steep on all sides, falling rapidly to 30 and 50 fathoms. The bottom is rock and can generally be seen. The anchor should be dropped if possible well in on the bank, as the ground is not good for holding and the water deepens suddenly.

Anchoring marks.—The windmill situated on the western side of the town of Akrotirion, Santorin Island, in range with the southeast extremity of Neo Kaimeni bearing 194°; the northern extremity of Mikro Kaimeni in range with the southern of three windmills at Manola, Therasia, 296°; and the southern slope of the hill northward of the crater of Neo Kaimeni in range with the boat passage separating the two islands, about 261° mark the center of the bank. The two northern of the three windmills on Therasia are close together.

At night the limiting line of the Epanomeria Light bearing 330° passes over the center of Anchorage Bank. During strong winds it will be necessary to keep the lead over the side and to have marks ashore in case of dragging the anchor.

Thera—Landing—Mooring Buoys.—The skala or landing place under Thera is built on a small natural platform sufficiently large to contain a few houses. At the back is a steep cliff, in which is cut a winding pathway to the town above. Merchant vessels are secured at the skala by chains to bollards cut in the cliff for the purpose, but there is no anchorage. There is a mooring buoy for small vessels about 100 yards from the shore of Thera.

A mooring buoy for the use of vessels of 3,000 tons is moored in 69 fathoms, 210 yards westward of the landing.

Port Megalo is the creek formed between Neo Kaimeni and Mikro Kaimeni eastward of it. It is open to the north and extends southward about 700 yards, being from 70 to 80 yards wide in the narrowest part, with from 7 to 15 fathoms water. As many as 20 vessels consisting of brigs and small craft lie here at times secured

Digitized by Google

to the shore, where there are bollards for the purpose. Vessels are also secured in the other creeks of the Kaimeni Islets.

A boat passage about 10 feet wide and 2 feet deep leads from the eastward into Port Megalo, southward of Mikro Kaimeni. Sulphurous water emitted from a spring at a temperature of 125°, easily distinguished by its color, and of a strong odor, escapes though this passage. If it be desired to clean the copper, a vessel can be secured by hawsers where the water is discolored, and in a few days all foreign substances will drop off. Summer is the best time for visiting the place for this purpose; in winter the winds are fresh and strong in squalls. It would be well to examine the locality prior to entering it in case any alteration should have taken place.

A vessel may also enter Port Megalo for the same purpose, anchor in 10 fathoms, and secure to bollards on either side with bow and stern fasts, which is the safest and most effectual way.

The prevailing winds in the summer are strong from the northeast, and in winter from the southward.

South coast—Anchorage.—In the bay on the south coast of Santorin, and about 1 mile southeastward of Cape Akrotirion, there is excellent anchorage in 7 or 8 fathoms water, sand and weeds, sheltered from all northerly winds, and round eastward to east-southeastward. At the eastern point of the bay rocks above water extend 200 yards from the shore, with sunken dangers round them.

Cape Exomiti.—Between the rocky point just mentioned and Cape Exomiti, 3 miles to the eastward, the coast forms a bay, in the center of which, at about 800 yards from the shore, there is similar anchorage to that just alluded to. Cape Exomiti, the southern extremity of Santorin, is a low point at the foot of Mount Platanimos, a limestone hill, on the southeast side of which are many ancient tombs cut in the rock. The cape is surrounded by rocks and shallow water which extend southward about 300 yards, and in continuation of the rocks to the westward are the remains of ancient moles. These remains are under water, extend westward about 800 yards, and inclose an area of about the same extent, with from 2 to 4 fathoms water. From the extremity of the northwestern mole the shore westward is skirted by rocks with shoal water.

Cape Messa Vuno.—From Cape Exomiti a low shore trends northeastward 2.4 miles to the high rugged steep cliffs of Messa Vuno, the termination of which is the cape of the same name, and the southeastern extremity of the island. At 2 miles northward of the cliffs is Kamari, a low rounded point, and about ½ mile to northwestward of the point is a monolith 100 feet high. As this monolith has been used for the construction of breakwaters at Kamari its height has probably been reduced.

Digitized by Google

Anchorages.—There is anchorage in 9 fathoms with offshore winds about ¾ mile northeastward of Cape Exomiti, the latter bearing 257°; also in the same depth of water about ½ mile southward of Kamari Point.

Coast.—From the latter point the coast trends northwest and westward about 8 miles to the northwestern extremity of the island. To the northward of Kamari Point the 5-fathom curve of soundings curves off ½ mile, and the north coast is bordered by a bank, and should not be approached too closely.

Harbor works.—A harbor for small vessels about ½ mile to the northward of Kamari Point, formed by two breakwaters, was commenced in 1905, but has since been abandoned.

Kolumbos Bank.—At 3½ miles 43° from Cape Kolumbos, the northeastern elbow of Santorin, is a bank of cinders with 10 fathoms water on it, about 400 yards in diameter within the 20-fathom curve, being the remains of a volcanic island, which first appeared during the earthquakes at Santorin in 1649.

Cristiani Islets are about 9½ miles 232° nearly from Cape Akrotirion, the southwestern point of Santorin. Cristiani, the larger and northern islet, nearly 1 mile in length north and south and about ¾ mile in greatest breadth, has a peak at the southwestern end 914 feet high; its shores are rugged and bold, and with the exception of some scattered rocks close inshore on the eastern side the water is deep.

The southern islet, named Askania, is 900 yards in length, 470 feet high, skirted all round by rocks, and separated from the northern islet by a passage about 700 yards wide, but there are rocks on either side, and nearly midway is a 2½-fathom shoal.

Eskhati Rock lies 1,800 yards 136° from Askania, less than 200 yards in length, and 45 feet high. Rocks lie close to its northeastern and southwestern ends, but the water 200 yards from it is deep.

Anaphi (or *Naphio*), about 12½ miles eastward of Santorin, is 6 miles in length east and west, 3½ miles in greatest breadth, and 1,530 feet high. Its hills are barren and naked, nor are the valleys and plains much more fruitful and they are but little cultivated. A small quantity of wheat, oil, honey, and wax are the only products. The island contains some excellent springs, and abounds now as of old in red-legged partridges. Anaphi was celebrated of old for its temple of Apollo Ægletes, and at the eastern end of the island there were remains of this temple in the walls of a Greek Monastery occupying the same site, but they were destroyed by an earthquake in 1888. The modern village is near the southwestern end of the island, and in 1907 contained a population of about 579.

Telegraph.—The village of Anaphi is a telegraph station.

Digitized by Google

Coast.—The coast is skirted here and there by rocks covered and uncovered, and near the southern side are the two little islets or rocks of Agios Nikolo and Rukana, 12 and 3 feet high, respectively, the latter being 3 miles from Kavo Kalamos, the eastern end of the island. At 1½ miles southward of Rukana are the two little islets or rocks of Ephtanah (Phlini), 50 and 60 feet high, with rocks above water on the east side of the eastern islet. Between the Ephtanah and the coast there are from 26 to 6 fathoms water, and here, under favorable circumstances or in case of necessity, a vessel will find anchorage. The little islet of Pakhia, 740 feet high, lies 198° about 4 miles from the eastern end of Anaphi, and 1.6 miles eastward of Pakhia is the islet of Makra, 420 feet high, both on the southeastern part of the bank which surrounds Anaphi.

Makra Rock.—At ¼ mile from the northeastern extremity of Makra Islet is a rock 3 feet high, and about 700 yards eastward of it is a patch with 5 fathoms water on it called Makra Rock.

Digitized by Google

CHAPTER VI.

COAST OF ASIA MINOR FROM CAPE ALUPO TO SAMOS STRAIT, WITH THE SOUTHERN SPORADES ISLANDS.

Rhodes Island.—This island, the most eastern of the Aegean Sea and a pashalic of Turkey, is 42 miles in length in a northeast and southwest direction, with an extreme breadth near the middle of about 17 miles, narrowing toward the ends. The island is mountainous, with spurs in various directions, the greatest elevations being in the central part, where, about 4 miles from the western coast, Mount Attayaro (ancient *Atabyrius*) is 4,068 feet above the sea. About 6 miles southwestward of this mountain, and within 1½ miles of the coast, is Mount Akramytis, 2,706 feet high. These lofty heights form a mountain barrier between the northwestern and southeastern sides of the island.

Mount Skathi, 9 miles from the southern end of the island, is 1,860 feet high; while Mount Kumuli, 8 miles from its northern end, is 1,366 feet high. The island is considered to be nearly equally divided into mountains and plains. From the lofty summits of Attayaro toward the town of Rhodes, to the northeast, the heights decrease, and the plains expand as the hills diminish. This district, which is cultivated on the sides of the hills and on the level land near the sea, produces wheat, and with better cultivation would yield an abundant crop.

Productions.—In the level land along the coast numerous streams irrigate the ground, which produces corn, figs, olives, lemons, oranges, melons, and other fruits. The richest part of the island is a narrow belt of plain along the northwestern coast, from the village of Kalavarda to the town of Rhodes. The eastern side of the island is not generally so fertile as the northwestern. Marble is quarried in several parts of the island; coral, with sponges, and excellent fish are found in the surrounding sea. The only beasts of burden are mules and donkeys, there being but few horses.

The minerals known to exist in the island are antimony, silver, lead, emery, manganese, copper, and calamine, but they are not worked.

Red-legged partridges and hares are met with on the hills; also woodcocks from November to February.

Digitized by Google

Population.—In addition to the town of Rhodes, the island contains about 44 thinly inhabited villages. The largest contains a population of about 1,600. The population of the whole island was estimated in 1907 to be about 30,000; of this number about 10,000 dwell in the town of Rhodes and its suburbs.

Climate.—Rhodes possesses an agreeable and healthful climate. During the summer it is never very hot, as a steady northwesterly wind prevails at that season.

Winds.—During summer the prevailing wind is northwesterly, blowing almost with the regularity of a trade. Vessels at this season may anchor on the eastern shore of the island with safety.

In winter southerly winds prevail, bringing with them cloudy weather and thick haze; during this season great caution is required in navigating the channel between Rhodes and Asia Minor.

Kum Burnu or Molino, the northeastern extremity of Rhodes Island, is low and sandy, but steep-to; it has a number of windmills on it. The channel between this cape and the coast of Asia Minor, nearly 10 miles wide, is deep and clear of danger. The current generally sets westward.

Landing may be effected in ordinary weather on either side of Kum Burnu, and also in Trianda Bay, about 2 miles to the southwestward.

Light.—A fixed red light is shown, at an elevation of 53 feet, from a mast over white house, about 280 yards from the extremity of Kum Burnu; it is visible 6 miles. (See Light List.)

Rhodes town, about ¾ mile southward of Kum Burnu, has an imposing appearance from the sea. It is built in the form of an amphitheater, on the ground rising gently from the water's edge, and is strongly fortified, having a moated castle of great size and strength, and is surrounded by walls flanked with towers. The works were constructed by the Knights of St. John, and bear evidence of the same skill as was afterwards exhibited in the fortifications of Malta.

A highly ornamented Gothic gateway leads from the quay to the town, but on entering the interior disappoints the expectations raised by the exterior. The streets are narrow and winding, but clean, and mean houses have generally replaced the substantial buildings of the knights. Many of the latter were destroyed by the explosion of a powder magazine in November, 1856; two years afterwards an earthquake completed the destruction. The massive houses in the street of the knights withstood the shock, and, with the hospital and city walls, are now the only remains of the mediæval portion of the city.

Colonna Rock, lying about 750 yards southeastward of Kum Burnu, and nearly 200 yards northward of Lazaretto Point, at the entrance of Tershaneh Harbor, received its name from the shaft of a column which formerly stood on it as a beacon. The rock, awash,

Digitized by Google

rises from the middle of a reef, with foul ground extending nearly 150 yards northward and about 100 yards eastward. Between the reef and Lazaretto Point there are only 8 feet water.

Harbors.—The town of Rhodes has two harbors, both artificial, and neither of them fit for large vessels.

Tershaneh, the northern harbor—Port Mandraki of the Greeks, and Porto delle Galere of the knights—is protected from the eastward by a mole of ancient construction extending from the shore 500 yards to the north, with the tower of St. Elmo on its extremity, close to which is the site of the Colossus of Rhodes. The two transverse piers at the entrance are much out of repair, and the sea breaks over them. The harbor has been allowed to silt up, and its northeastern corner is very shallow. It is open to the north, and the passage in between the ends of the piers is very narrow; between them there are only 8 feet water, though farther in the depth is 18 feet.

On the western shore of the harbor is a stone quay, alongside of which is, however, only about 1 foot of water; behind the quay is a broad promenade.

Wreck.—The wreck of a vessel with two masts showing above the water lies sunk in the entrance to Rhodes Harbor, on the bearings: St. Angelo Tower, 191°; St. Elmo Tower, 285°.

The southern harbor is protected from the eastward by a mole 300 yards long, extending from the shore at the eastern angle of the city in a northerly direction and having on its extremity the round tower of St. Angelo, 74 feet high; rocky foul ground extends 130 yards northward of this mole. A transverse mole, on the extremity of which are the remains of Arab's Tower, extends from the northern angle of the city eastward toward the tower of St. Angelo. The harbor thus formed is nearly 200 yards deep and a little more than 200 yards wide at the entrance, with from 22 feet water in the entrance to 10 feet near the head, over sandy bottom.

The tower, formerly a most conspicuous object from the sea, was destroyed by an earthquake in 1864; these are not uncommon, and are often very destructive.

The harbor is open to the north, but is considered safe, as the wind seldom blows from that quarter and does not send in much sea. Small vessels haul within the piers on the western side of the harbor, but the water is very shallow in this space; larger vessels moor with a stern-fast to the eastern mole, which, if the wind sets in from the northward, they are obliged to slack up. Vessels lie here quite secure in southeast gales, which is the wind most dreaded on this coast, as it raises a very heavy sea.

Lights.—From a white tower in Fort St. Elmo, at an elevation of 82 feet above the sea, is exhibited a flashing white light, visible 14 miles.

Digitized by Google

A fixed white light with green sector is exhibited, at an elevation of 44 feet, from a white iron support over a white house with a red roof at the foot of St. Angelo Tower. It is visible 8 and 4 miles in the white and green sectors, respectively. (For sectors see Light List and Chart.)

Khatar Rocks.—At nearly ¼ mile southeastward of the tower of St. Angelo is the termination of a ridge of black rocks, projecting from the shore in a northerly direction; from the outer end a shoal extends ¼ mile northeastward, having on its extremity, Khatar Rocks, with only 10 feet water over them, and 6 fathoms close to their outer edge.

To pass northward of Khatar Rocks keep the mosque (standing a little inside of the pier on Lazaretto Point) well open northward of the tower of St. Elmo bearing about 282°.

Liman—Buoys.—A mooring buoy is established 213 yards 232° from St. Angelo Tower.

A mooring buoy is anchored in the southern harbor about 200 yards 256° from St. Angelo tower, for torpedo craft.

Directions.—At night, in steering for the anchorage, keep the light on St. Elmo bearing westward of 277° until the light on Kum Burnu bears 300° or until St. Angelo Light changes from white to green; a vessel will then be near the summer anchorage. In leaving at night, St. Elmo Light should be kept westward of a 277° bearing until outside Khatar Rocks.

Anchorage.—During the summer vessels may anchor in from 12 to 18 fathoms water, sandy bottom, with the tower of St. Elmo bearing 277° or 289°, distant from 400 to 600 yards; in this season no danger is to be apprehended from southeast winds. In the winter season a vessel should not anchor inside a depth of 25 to 30 fathoms, with the tower of St. Elmo bearing west-southwest distant ½ mile; from this position, should the wind blow in, a sailing vessel would be able to proceed to sea on either tack. The bottom in general is loose sand, though here and there are spots of better holding ground.

When the wind is strong from the eastward, vessels anchor in Trianda Bay, west of Kum Burnu, or seek shelter in Marmarice Harbor.

Current.—The current in the roadstead generally sets to the northward, but occasionally it will run southeastward.

Trade.—The chief articles of export are fruit, sesame seed, leather, wine and spirits, dried fruits, and beeswax; the imports being cotton and woolen goods, cereals and flour, sugar, hardware, tobacco, cattle, coffee, timber, hides, and rice.

The landing place is on the northwestern side of Tershaneh Harbor.

Digitized by Google

Coal.—There is usually about 150 tons of Welsh coal in stock and 100 tons of Heraklea coal, but if required notice must be given in advance.

Provisions are obtainable.

Water may be obtained from a fountain near the landing place in the southern harbor, and in Tershaneh Harbor, but the supply is limited and during the summer it sometimes fails entirely.

Repairs.—Small wooden vessels for service in the Levant are built here, and uncoppered wooden vessels can be repaired. There are no facilities for repairs to iron vessels.

Communication.—Rhodes is connected by telegraph cables with Marmarice and Crete, thence to Egypt and Europe. Messages can consequently be sent to all parts of the world.

Messageries Maritimes steamers call here monthly on their way from Constantinople and Smyrna to Beirut; Russian steamers occasionally call on their passage to and from Odessa and Beirut. A Turkish steamer runs fortnightly to Saloniki, Cyprus, and Alexandria, and a Greek steamer connects with Smyrna, Khios, Lero, and Alexandria.

Southeast coast.—From the town of Rhodes the coast trends southward 3¼ miles to Cape Vudhi, being low and rocky, but free from danger 400 yards off. Cape Ladhiko, 4¼ miles to the southward of Cape Vudhi, is a high bold cliff rising to a hill 540 feet in height. Between the capes the land falls back westward, forming Kalitheas Bay, which is rather less than 1 mile deep; the northern part of the bay is clear of danger at ¼ mile from the shore.

In the southern part of Kalitheas Bay a rocky patch with 2 to 3 fathoms on it lies nearly 1,400 yards 19° from the southern point of Kalitheas Bay, ½ mile northward of Cape Ladhiko.

From Cape Ladhiko to Cape Archangelo, a distance of 9 miles 204°, the coast is nearly straight, having only a few slight indentations. The northernmost of these, named Aphandos Bay, between Cape Ladhiko and Cape Vahyah, which is mainly low and sandy, is free of danger except a small 5-fathom patch ½ mile off the beach and 1¼ miles 19° from Cape Vahyah. Southward of Cape Vahyah the coast is low and cliffy, with rocks, but clear of danger a short distance off.

Water.—At 3 miles from the latter cape and ¾ mile northward of two small islets is a stream of good water.

Viglika Bay is the southern portion of a deep indentation in the coast between Cape Archangelo and Cape Agios Milianos. It is open to the northeastward, but is said to be quite secure in the winter from those winds, which then seldom blow, and send home but little sea. The best anchorage is in the southwestern corner, in from 19

Digitized by Google

to 7 fathoms, mud, well sheltered from the southeast. The shores of this bay are composed of smooth, rounded pebbles, which are much used in the island for pavements and roads and are frequently exported to Smyrna and other places for the same purpose.

Water.—In the northern part of Viglika Bay is a ruined castle on a projecting rocky eminence, and near it is a good fountain of water. There is also a considerable stream near the center of the bay during the winter, but in summer it dries up.

Port Lindos, at about ½ mile southward of Cape Agios Milianos, is about 300 yards wide at the entrance, opens out within to 600 yards in width, and is 700 yards deep. It forms a snug little anchorage in from 6 to 4 fathoms water, well sheltered from all winds but those from east-southeast.

In former times, when this place had a trade of its own, the vessels belonging to it used to winter in Viglika Bay.

The town of Lindos, half in ruins, lies on the northern and western sides of a rocky hill rising from the southern shore of the port. It was once celebrated for a temple of Minerva, of which only the foundations are left; there is also a portion of a theater that has been hewn out of the rock.

Shoal.—At the entrance of the northern bight is a narrow shoal nearly 200 yards in length, with 2½ fathoms on it.

Pendi Nisia Shoal.—A small islet with foul ground around, called Pendi Nisia, lies about 1¼ miles southward of Port Lindos and nearly in the middle of the entrance of a rocky bay; a rocky patch with 5½ fathoms on it and very deep water close-to bears 111°, ¾ mile from the islet. Mount Lindos, about 2½ miles northwestward of the cape of the same name, in range with Pendi Nisia, leads over the patch.

Cape Lindos or Lardos, 3 miles from Cape Agios Milianos, has a ruined tower on its summit, and three small islets lie about 700 yards northward of it.

Paximada Rock.—At a little more than 2 miles 174° from Cape Lindos is Paximada Rock, high and steep-to all around.

Lardos Bay.—The coast turns sharply to the westward for 2 miles from Cape Lindos and then curves northward and around southward, forming Lardos Bay, where from a depth of 20 fathoms at a long ½ mile from the shore the water shoals gradually in, but the bay is open from southwest to southeast.

Coast.—From the western part of Lardos Bay the coast trends southwestward to Cape Vigli, distant 12½ miles, and then gradually around westward for 5 miles to Cape Praso Nisi.

Shoals.—The whole of this shore is clear of danger, excepting a rock with less than 1 fathom water over it lying ¼ mile 190° from Cape Vigli and a small patch of 2½ fathoms 1,400 yards 103° nearly

Digitized by Google

from Cape Katabia and 2½ miles from the southeastern part of Cape Praso Nisi. To avoid the shoal keep the western extremity of the latter cape open of the point eastward of it.

Khina Rocks, lying 7.3 miles 100° from Cape Praso Nisi, are two in number and steep-to all around, but, being very low, are dangerous at night.

Cape Praso Nisi, the southern extremity of Rhodes Island, is a rocky, irregular peninsula connected to the main by a low, sandy isthmus, which causes it to be often mistaken for an island.

Light.—From a lighthouse 164 yards within the extremity of Cape Praso Nisi, at an elevation of 213 feet above the sea, a flashing light, showing red and white flashes, is exhibited; the light is visible 21 miles. (See Light List.)

Rocky banks.—A rocky bank with depths of from 16 to 46 fathoms is reported to be situated about 10 miles to the southeastward of Cape Praso Nisi.

A deep rocky bank extends from Cape Praso Nisi in a southwestward direction for a distance of 8 miles. The body of the bank has a depth of from 50 to 70 fathoms, coral, sand, and gravel, deepening to 90 fathoms at the outer end, when it suddenly increases to 150 fathoms over yellow mud.

Current, caution.—A current sets over this bank in a northwesterly direction at the rate of ¾ knot an hour, causing during northwest winds a hollow cross sea, which is dangerous to deeply laden small vessels.

Southwest coast.—From Cape Praso Nisi the coast trends northwestward 4 miles to Cape Karavolos, then northward 10 miles, when it takes a northwesterly direction to Cape Monolithos, which bears nearly 354°, 12¾ miles from Cape Karavolos, forming between them the bay of Palatshah or Apolakia, about 3 miles deep.

There are two rocky islets lying in the vicinity of Cape Karavolos. One of the same name as the cape bears 255°, ¾ mile from it; the other, Octonya Nisi, having rocky ground running off its southwestern end, lies 3 miles 350° from the cape. With the exception of these islets the bay of Apolakia is clear of danger, with soundings gradually decreasing toward the beach from about 60 fathoms.

Khalkia Island, the southwestern point of which bears about 294°, 8½ miles from Cape Monolithos, is the most western of a group of islands and rocks extending westward from between Capes Monolithos and Kopria, the salient points on the northwest coast of Rhodes Island, which are nearly 9½ miles apart.

Khalkia Island, 5¼ miles in length and 1½ miles in breadth, is high, rugged, and barren, with a peak one-third from its eastern end 1,954 feet above the sea. The population is about 2,500, mostly sponge fishers.

Digitized by Google

Emporio Bay.—On Khalkia Island are two villages inhabited by sponge divers and their families, and it possesses a small harbor at the southeastern part named Emporio Bay, protected from the eastward by an island in the middle of the entrance having on both sides a passage with deep water. There are 20 fathoms at the entrance, decreasing to 7 fathoms off the landing place, where small vessels lie quite secure. The harbor is difficult of access during westerly winds, which rush down in squalls from the high hills with which it is surrounded.

Communication.—Steamers of the Pantaleon Co. call weekly from Rhodes and Smyrna.

Alimnia Island, the next in extent to Khalkia and 3¼ miles northeastward of that island, is 900 feet high and possesses a harbor on the southwestern side which, although very deep, has anchorage in 8 to 10 fathoms off a small village at its head. A shoal with 3 fathoms water on it extends 600 yards northeastward from the eastern point of the entrance; a rock with a sunken one outside it lies close to the western point of entrance.

Tragusa Islet.—Between Khalkia and Alimnia are several islets, and nearly halfway between them and the coast of Rhodes are three others. They are all bold-to excepting Tragusa, lying 1¼ miles southward of Alimnia, and which has a patch of rocks awash with shoal water round it 700 yards off its southern extremity.

A rock awash, with shoal water around it, also lies about ¼ mile westward of the little islet of Nisaki, the second islet from the southward.

Supplies.—Neither water nor supplies of any kind are to be obtained at any of this group of islands.

Northwest coast.—Between Cape Monolithos and Cape Kopria the coast of Rhodes is high and rocky, but steep-to. On the highland above Cape Kopria are the ruins of an old castle, and near the shore midway between the capes are two round towers 1¼ miles apart. The coast is backed at 1½ miles and about 4 miles inland by the lofty heights of Akramytis and Attayaro, before mentioned.

From Cape Kropia to Kum Burnu, a distance of about 23 miles, the shore is a sandy beach, with depths of 5 fathoms, from ¼ to ½ mile off. It maintains the latter distance for several miles from a point about 5½ miles northeastward of Cape Kopria, and within the shore is a narrow belt of plain, well cultivated.

During the summer the wind blows strong along this part of the coast from west-northwest, with but little interruption.

Sterneck Deep.—Almost the greatest depths of the Mediterranean have been found 20 miles from the southeast coast of Rhodes Island, and the above name has been given to a depression of 2,113

Digitized by Google

fathoms, yellow clay bottom, situated 27 miles 145° from Kum Burnu, the northeastern extremity of Rhodes Island.

Cyclades.—The islands of Saria, Scarpanto, and Kaso or Caxo are the southern of the ancient *Cyclades*. They lie midway between Rhodes and Crete and have on either side wide and deep channels leading into the southeastern part of the archipelago. The inhabitants are principally Greeks, but the islands belong to the Ottoman Empire.

Saria Island.—Cape Paraspori, the northern extremity of Saria Island, the most northern of the group, is distant 26 miles 257° nearly from Cape Praso Nisi, the southern extremity of Rhodes Island, the channel between being known as Scarpanto Strait. Saria Island is nearly 4½ miles in length in a north and south direction and from ¾ mile to 2 miles in breadth; the southern part rises to a height of 1,853 feet.

The eastern coast of the island is composed of very high cliffs, with deep water close in. There is one small break in this wall, about 1 mile from the northeastern point, which is a little sandy bay surrounded by ancient ruins named Palatia. The western side of the island is not so cliffy as the eastern and has several indentions, but the deep water is close in to the shore.

Scarpanto Island (ancient *Carpathos*) is only separated from Saria by a shallow channel about 100 yards wide, which on the western side suddenly opens out, forming a deep-water bay upward of ½ mile in breadth, the northeastern sandy corner of which is named Armyro. Westerly winds blow right into this bay.

Scarpanto is about 26 miles in length in a north and south direction and from about 2 to 6 miles in breadth. A ridge of high mountains extends the whole length of the island, many of the spurs and ravines of which descend to the coast; the highest peak, Mount Kalolimni, about 11½ miles from the southern end of the island, rises to a height of 4,000 feet. The greater portion of the inhabitants, numbering about 8,000, mostly Greeks, reside in nine villages, well up the mountains, at the southern part of the island.

Communication.—Steamers of the Pantaleon Co. call fortnightly from Smyrna and the adjacent islands.

East coast.—The northern half of the east coast of Scarpanto principally consists of high cliffs, with numerous indentations. Rocks and shoal water front a large portion of it, extending in several places upward of ½ mile from the shore. The southern portion of the coast is bolder, and deep water comes close up to the cliffs. On the southeastern side are three open bays named Pegadia, Amorphos, and Makri Yalo, in either of which vessels might find shelter from northerly or westerly winds, in a moderate depth of water, about 700 yards from the shore.

Digitized by Google

Pegadia Bay, on the northern side of Vuthia Peninsula (the southeastern extremity of the island), is about 10 miles from Castello Point, the southern extremity of Scarpanto, and is open to northeast and easterly winds. In the southern part of the bay are several little islets and a skala or landing place, with some ruins near it, and 1½ miles inland on the mountain southwestward of the bay is Menites, the largest village on the island.

This bay affords excellent protection during the strong northwesterly winds which occur during the summer months. The soundings shoal regularly from 16 fathoms toward the beach. The British naval vessel *Sylvia* anchored in 10 fathoms, dark muddy sand, with the following bearings: Vrontos Point, 37°; Vuthia Point, 131°, and the inner rocky islet, 172°. There are a few houses and a small Greek Church in the southern part of the bay, and a small protected nook or boat harbor is used by native craft in the sandy bight eastward of the skala.

Supplies of fresh meat and fruit may be obtained.

Amorphos Bay, 2 miles farther southward, is quite open to the south and easterly winds; 1½ miles farther southward and ½ mile offshore is Prassu Nisi, surrounded by rocks and shoal water.

Makri Yalo Bay, the southern of the above anchorages, is nearly 3 miles northeastward of Castello Point. In making for this bay from the southward give Legi Point, the southern extremity of the bay, a berth of ½ mile and the coast between it and Castello Point a berth of ¾ mile, to clear the shoal patches extending from the shore. The bay is quite open to the eastward.

Tristoma Harbor.—On the western side of Scarpanto and ½ mile from its northern extremity is the small harbor of Tristoma, running in east about ¾ mile, 300 yards in breadth, with a depth of from 4½ to 9 fathoms water. In the entrance are two islets, and the channel into the harbor, which is only 170 feet wide, is southward of South Islet, the two northern channels only admitting boats. Just inside the narrowest part of the entrance is a bar with 27 feet most water over it. On the slopes of the mountains on either side the ground is terraced and cultivated. There is a considerable village in Fishery Point, on the northern side of the harbor.

Water.—At the head of the harbor are two springs of water; that on the north is drinkable, but the southern is slightly brackish.

Vurgounda Point.—At nearly 2¼ miles 244° from Tristoma Harbor is Vurgounda Point, on the eastern side of which is a small bay open to the northward. On the western side of the bay is a village, and a pier runs out some distance from the shore. A little islet lies on the eastern side of the entrance.

West coast.—The coast from Vurgounda Point to So Kastro, an islet close to the shore and united by rocks to the elbow or western

Digitized by Google

extremity of Scarpanto, a distance of 13½ miles, has deep water all along close to the shore. The northern part consists in places of high cliffs, with depths of more than 100 fathoms nearly alongside them. Southward of the steep cliffs the coast is sinuous and skirted with rocks.

At about 9 miles southward of So Kastro Islet is the cliffy cape, Agios Theodoros. The coast between falls back nearly 2 miles, and is irregular with cliffy projections, skirted by rocks, and about midway the 100-fathom curve of soundings is 1 mile from the shore. At 2 miles northward of Cape Agios Theodoros is a peninsula projecting about ½ mile from the line of coast, named Paleo Kastro. On the southern side of the peninsula is a bay where a small vessel might anchor with offshore winds in from 10 to 6 fathoms. The little islet of Khalkyas lies at the entrance. Northward of the peninsula is a cliffy indentation, and at the northern and southern extremities of this indentation are respectively the little bays of Phineki and Arkasa, with anchorage for small vessels. Both these bays are open to the westward. In Arkasa Bay there is a village with a population of about 500.

Dangers—Carpatho Rock, with less than 1 fathom water on it and 15 to 20 fathoms close round, lies with the center of the patch bearing 283°, 1½ miles from the southern extremity of Cape Agios Theodoros, and 72°, 1¾ miles from Strongilo Nisi, off the eastern extremity of Kaso; it is thus nearly in the middle of the channel between Scarpanto and Kaso Islands. To avoid this danger keep over toward the northeastern point of Kaso Island, which with Strongilo Nisi, the islet close off it on the north, has deep water close-to.

Two-fathom patch.—Another patch, with 2 fathoms water on it, lies 800 yards 234° from the northern extremity of Cape Agios Theodoros. Great caution is therefore required in rounding the cape.

Castello Point.—From Cape Agios Theodoros the coast, which is irregular and rocky, trends southeastward and terminates at the distance of 3¾ miles in the peninsula point of Castello, the southern extremity of Scarpanto, already alluded to. On the northwestern side of Castello Point is Castello Bay, with from 20 to 10 fathoms water, and where shelter might be had from northerly or easterly winds. The bay is open to the southwest, but is slightly protected from the westward by Kaso Island, about 5 miles distant in that direction. The 100-fathom curve of soundings passes about 1 mile southward of Castello Point, and between this and a little northward of Paleo Kastro the bank, with less than 100 fathoms on it, extends to about 3½ miles westward of Kaso Island.

Digitized by Google

Kaso or Caxo.—This island (ancient *Kassos*), 9½ miles in length in an east-northeast and west-southwest direction and 3¾ miles in extreme breadth, is separated from Scarpanto by a channel 3 miles wide, but which is interrupted in the middle by Carpatho Rock, just mentioned. The island, 1,700 feet high, is very mountainous on the southeastern and southwestern sides, sloping toward the northwestward, in which part most of the villages are situated. The population is about 7,500, nearly all Greeks. The shores of the island principally consist of high rocky cliffs with deep water close-to. Agios Georgio Point, the northwestern extremity, is bordered by shallow water and at nearly ½ mile off there are only 5 fathoms. Close off the southwestern end are Plati and the two Kurekia Islets, the latter being nearer to the coast.

At 700 yards northward of Kavo Aktis, the northeastern end, is Strongilo Nisi, less than 400 yards in extent. A little more than 2 miles westward of it is the rock or islet of Kholofonos, about ½ mile from the coast.

Kaso Island suffered severly from the effects of the Greek revolution and became nearly depopulated, but has now recovered, and the inhabitants have some trade.

Communication.—The Pantaleon Co. steamers call here from Smyrna and the neighboring islands every fortnight.

The islets of Kaso are a group of islets extending over a distance of 4¾ miles and nearly parallel to the northwestern side of Kaso island. The channel between is from 1.3 to 3 miles wide. Good anchorage may be found under the islets sheltered from northwest winds; the best place is off the middle of the long flat islet of Makro Nisi, at the northeastern end of the group, in from 10 to 12 fathoms water, over sand.

From this anchorage Ophris village, on the shore of a small bay eastward of Agios Georgio Point, the northwestern extremity of Kaso Island, is nearly 2 miles distant. It is difficult to land at Ophris with northerly winds.

Kaso Rock, with 15 feet on and deep water round it, lies nearly in the middle of the western part of the channel between Armathia, the largest of the Kaso Islets, and Kaso. Kholophonos Islet, in range with the northwestern part of Agios Georgio Point, bearing 73°, leads 400 yards southward of this danger.

Armathia Bank, with 4 fathoms water on it, lies 1,200 yards 193° from the eastern extremity of the little islet united by rocks to Plato Nisia (or the third islet of the group from the westward). There are other shoal patches and detached rocks around and between the islets, but they will be avoided by keeping on the Kaso Island side.

Digitized by Google

Stakida.—This group of four islets extends over a space of 2¼ miles north and south, the largest being about 200 feet high. They are steep-to and lie nearly midway and a little northward of a line between Unia Nisia and the northern end of Saria, distant from the latter about 18½ miles.

Scarpanto and Kaso Straits are the great channels into the archipelago from the eastern part of the Mediterranean. The former lying between Rhodes on the east and Saria and Scarpanto Islands, on the west, is 24 miles wide and clear of danger, as the least water on the bank extending off Cape Praso Nisi, the southwestern extremity of Rhodes, is 40 fathoms. The western side of the strait is deep, and the coast of Saria Island is high and steep-to.

Kaso Strait is about 25 miles wide between the southwestern end of Kaso Island and Elasa Island, lying 2½ miles 154° from Cape Sidero, the northeastern extremity of Crete. The strait is very deep and the only dangers are the shoals which extend 1¼ miles in an easterly direction from Cape Sidero.

The Current in Scarpanto and Kaso Straits usually runs to the southward; sometimes southerly and southwest winds will cause an easterly current in the southern part of the archipelago and greatly increase the current through the straits. The only rule, however, that can be given to assist the navigator is to allow for a current of from 1 to 1½ knots an hour in the direction of the wind when it amounts to a fresh or even a moderate breeze.

Unia Nisia are two islets 17½ miles 257° from Stakida Islets. They cover a space of nearly 1¼ miles east and west, and can be seen from a distance of 20 miles, appearing on some bearings as two hummocks close together.

Kamila Nisi.—At 11 miles 280° from the Unia Nisia is Kamila Nisi, about 1 mile in length northeast and southwest.

Avga Nisi is a little islet rather more than 6 miles 18° 30′ from Unia Nisia.

Sophrana Nisia are two rugged islets, the larger, Megalo Sophrano, about 600 feet high, being the northern, Makri Sophrano the southern, with a small islet or rock between them, the whole extending over a distance of 3 miles north and south. They lie 19 miles southwestward of Wreck Rock of Sirina or Agios Ioannis Islands.

Karavi Nisia are two little islets or rocks lying 2¾ miles south-southeastward from Sophrana Nisia.

The above islets lie within a radius of about 10 miles, the water around them being deep.

Stampalia.—This island (ancient *Astypalæa*), belonging to Turkey, is about 23 miles east-northeastward of Anaphi and extends 9½ miles in the same direction. The island has a Greek population

Digitized by Google

of about 2,500. It is most irregular in shape, forming several bays and inlets, and consists of two large elevated rocky masses united by an isthmus, which in the narrowest part is only about 120 yards across. The southwestern part of the island is 7¼ miles in length and 1,660 feet high, and the northeastern 6 miles in lengtn and 1,299 feet high, each lying in a northwest and southeasterly direction. The deep bights on either side of the isthmus give at a distance in the above directions the appearance of two islands.

Livadhia, the chief town, is situated on a promontory forming the northern side of the bay of the same name, on the east coast of the southern portion of Stampalia Island, and contains a population of about 1,500, many of whom get their living by fishing, and are tributary to the Pasha of Rhodes. It has a large number of churches and chapels, sometimes as many as six in a row. They are built to a great extent from the ruins of the ancient temples, and in every part of the town are seen capitals of columns and other remains. Here is a stately medieval castle, commanding a splendid prospect. The skala or landing place is in the little bay on the northern side of the promontory on which the town stands.

Communication.—The best way to reach stampalia is by boat from Kalimno Island or Rhodes.

Landing is prohibited during the night from any vessel.

Southwest coast.—Kavo Khilus, the southeastern extremity of the southwestern part of Stampalia, is a small cliffy peninsula 249 feet high. The steep irregular coast thence trends westward and northward to the islet of Katergari, a distance of about 7¾ miles, and between there are one or two small coves with beaches. The coast is backed at 1 mile within by high mountainous land, and the water all along deep. Katergari Islet is about 400 yards in diameter and the same distance from the shore, with 4 fathoms water between from it a rocky shoal extends about 200 yards southwestward. Liani Point, the northwestern extremity of Stampalia, is nearly 1.4 miles northward of Katergari. Nearly midway between is a reef with a rock above water extending 600 yards from the coast, named Kutsimi, and steep-to.

The little round islet called Panormos Nisi lies 600 yards northeastward of Liani Point. There are 3 and 4 fathoms water around it and 27 fathoms midway between it and the point.

Pontikutha Islet.—On the bank westward of Stampalia are the islets of Pontikutha and Ophidusa. Pontikutha is bold, rugged, 1,600 yards in length, and steep-to all round except at its northeastern side, where the water shoals a little off. The islet is 1.3 miles from Kavo Armenoi, a sharp cliffy point projecting from the central part of the coast, the water between being about 40 fathoms deep,

Digitized by Google

over a level bottom. At 1.1 miles southward of Pontikutha are three little islets or rocks called Ktenia, steep-to all round.

Ophidusa Islet lies 3½ miles westward of Pontikutha; it is 2 miles in length north and south, its eastern side being nearly straight. Toward the northern end are some Hellenic ruins. The island is narrow, but the northern part which is triangular in shape and ¾ mile in length east and west. The coast consists of bold steep cliffs, and the water all round is deep close-to, except at the western extremity, where a reef extends off 300 yards.

Northwest coast.—The great bight on the northwestern side of Stampalia is about 5½ miles wide at the entrance and from a line between the two extreme points 3½ to 4 miles deep. The coast on either side is indented with bays and inlets. It is divided into two parts by a chain of islets named Phokeo Nisia, extending upward of 2 miles northwestward from the isthmus. The shores of the isthmus and islets are bordered by shallow rocky ground, which runs off nearly ½ mile northward of the islets. There is no passage between the islets or between them and the isthmus except for boats or vessels of light draft.

Port Panormos.—The principal inlet on the western side of the deep bight is Port Panormos, which is 1,400 yards long, with depths of from 40 fathoms at the entrance to 9 fathoms at its head. The port is 1,400 yards eastward from Liani Point, and open to the northward.

St. Andrea Bay, the head of the great bight westward of Phokeo Nisia, has anchoring depths of from 15 to 6 fathoms, but it is open to the northwest.

Port Vathy.—On the eastern side of the bight is Port Vathy, a basin in the interior, nearly 1 mile in length, with from 1 to 5 fathoms water, but the narrow passage into it is barred by a shoal with only 1½ fathoms water on it. In June, 1877, it was found that a wooden pole would penetrate to a depth of 30 feet in any part of the entrance.

Vaie Inlet, at the southeastern corner of the bight, is 1 mile long, with from 15 to 8 fathoms near its head, but like St. Andrea Bay it is open to the northwest.

Northeast coast.—The northeastern coast of Stampalia is nearly straight, composed of steep rocky cliffs broken by several inlets, and backed by highland; it is all along steep-to.

Southeast coast.—Between the southeastern extremity of the eastern part of the island and the narrow part of the isthmus the coast forms several bays or inlets, and on the bank fronting it are 9 or 10 islets, besides rocks and shoals.

Kunupia.—The outer and largest of these islets is Kunupia, 1.1 miles in length north and south and nearly divided into two parts,

Digitized by Google

the southern part being connected to the northern by a low sandy neck.

Kutzomiti.—At 1,300 yards northwestward of Kunupia is Kutzomiti Islet, smaller, though nearly of the same length as the former, but lying in a northeast and southwesterly direction; between the two are four smaller islets or rocks surrounded by shoal water.

Baraka Xera.—At 1.2 miles northward of Kutzomiti and fronting the deep bay westward of the eastern extremity of Stampalia is the Baraka Xera, with only 2½ fathoms water on it. The shoal lies 700 yards southeastward from Baraka, a rounded headland 164 feet high, the eastern entrance point to Port Agrilithi; the southern side of the shoal is steep-to, but at the northern side there are from 5½ to 9 fathoms.

Agio Kyriaki Island lies 1½ miles westward of Kutzomiti. It is about 700 yards in diameter, 81 feet high, and bordered by a narrow bank with sunken rocks here and there. On its southern side is a rocky cove, and close to its southeastern end is an islet with shoal water extending nearly 200 yards eastward.

Shoal.—On the bank next southward of Oxo Xera Shoal, at a distance of 1,120 yards 161° from Agio Kyriaki Church, is a shoal of 4 fathoms. The depths over this bank are very uneven, and it is unadvisable to anchor upon it even temporarily.

Oxo Xera.—Southeastward of Agio Kyriaki are three banks known collectively as Kyriaki Shoals, the southern with 21 fathoms water on it, the middle with 6 and 7 fathoms, and the northern, named Oxo Xera, with 2 fathoms. This latter shoal, nearly 400 yards in length within the 5-fathom curve, has general depths of 3 and 4 fathoms; its shoalest head with 2 fathoms lies 1,100 yards 161° 30′ from the southern extremity of the islet, at the southeastern end of Agio Kyriaki. The western extremity of Glino Nisi, bearing 335°, open westward of Agio Kyriaki, leads westward of the shoal.

Konomato Xera.—This shoal, which is 300 yards in extent, lies northeastward of Agio Kyriaki and has only 1¾ fathoms water on its shoalest part and elsewhere from 2 to 4½ fathoms. Between the shoal and the shallow water bordering Agio Kyriaki the passage is about 550 yards wide, and the northeastern extremity of Glino Nisi, in range with the southwestern point of Kondro Nisi, bearing 324°, will lead through in mid-channel.

At about 60 yards northeastward of the extremity of Skinonda Point, in the central part of Port Maltezana, is a white obelisk, about 14 feet high, which, kept open eastward of Kondro Nisi, bearing 316°, leads eastward of Konomato Xera.

Bogazeu Xera.—At nearly 400 yards northwestward of Agio Kyriaki is the Bogazeu Xera, a shoal with 3 fathoms water on it;

Digitized by Google

from 100 to 300 yards northeastward of the shoal are other patches with 4 to 5½ fathoms. These shoals patches will be avoided by keeping westward of a line joining the western extremities of Glino Nisi and Agio Kyriaki until the western point of entrance to Port Agrilithi is in range, or nearly so, with the southern extremity of Kondro Nisi, bearing 49°, this latter mark will lead northward of the shoals, or between them and Glino Nisi.

Port Maltezana is formed on the southern side of the isthmus which unites the two parts of Stampalia. The port is nearly 1¼ miles in length and nearly ½ mile in greatest breadth, with from 4½ to 16 fathoms, sand and mud. It is well sheltered and covered on the south by the islands of Glino Nisi and Kondro Nisi and adjacent rocks. It is bordered all around by a shallow bank, and 200 yards 131° from Skinonda, the central point, is a detached shoal with 4 feet water on it.

There are three entrances to the port. The western, northwest of Glino Nisi between two little islets, 32 feet and 18 feet high, with a depth of 3¼ fathoms, is fit for small vessels only. Between Glino Nisi and Kondro Nisi is a deep entrance which may be taken by a vessel under steam or with a fair wind by keeping in mid-channel and avoiding the shoals off the salient points; a shoal with 3 fathoms on it lies 200 yards 305° from the northwestern extremity of Kondro Nisi. The eastern entrance or passage northward of Kondro Nisi is, however, the best, especially from the eastward, taking care to avoid the Baraka Xera and the shoal extending 100 yards from Vriseu Punda, the point opposite or northward of Kondro Nisi.

There is also temporary anchorage during fine weather in summer in the bay formed between Makria Punda and Glino Nisi; the bottom is sand and mud, but the water is rather deep.

Water.—At the head of the port at the western end there are some wells of good water.

Sirina or Agios Ioannis Islets.—At 8½ miles southeastward of Kunupia Islet is a group of three little islets named the Adelphæ, extending 2 miles east and west, with deep water around them.

Sirina Island lies 3½ miles southeastward of Adelphæ Islets. It is about 2½ miles in length, rugged, and 1,087 feet high, with deep water around it.

At 1½ miles southeastward of Sirina and on a separate bank is Goat Islet, 35 feet high, with a sunken rock on its eastern side and a rock or islet, 10 feet high, called Kid Rock, southwestward of it. On the same bank farther southward are the Tria Nisia, with 9 fathoms water between. The southern islet of Tria Nisia is 232 feet high, and 2 miles westward of it is Wreck Rock, 10 feet high, on another bank, and appearing like a vessel's hull.

Digitized by Google

Kandeliusa.—This island (*Madonna*), 1 mile in length, 1 mile in breadth, about 180 feet high, and steep-to all around, is about 16 miles northeastward of Sirina or Agios Ioannis Islands, the passage between being deep and clear.

Light.—From a white tower, 33 feet high, on the western side of the lighthouse keeper's dwelling, 109 yards within the southwestern extremity of Kandeliusa and at an elevation of 180 feet above the sea, a fixed and flashing white light is exhibited, visible 18 miles. The light is partly obscured by the island. (See Light List.)

Shoal.—A shoal, with a depth of less than 6 feet, lies 546 yards 232° from the lighthouse.

Piskopi or Tilo.—This island (ancient *Telos*), about 8¼ miles in length northwest and southeast and from 1 to 4 miles in breadth, is irregular in shape and indented by several bays. It is mountainous throughout its length, and at the northwestern end Agios Elias, the highest peak, attains an elevation of 2,010 feet. The hills around the island rise into detached peaks of considerable height, and add much to the beauty of the scenery. The northwestern coast consists of high cliffs. There are several remains of antiquity in fragments of columns, altars, and inscriptions, and on the shore of Livadia Bay is an extensive ruined fort of the Cyclopean order, now the resort of partridges. Some Venetian towers still remain.

There are two villages on Piskopi, and the plain between them is well cultivated and produces almonds (the staple), olives, vines, figs, etc. The population of the island number about 3,000 Greeks, who pay a small tribute to the pasha of Rhodes and who maintain themselves by agriculture.

Supplies and water.—Pigs are reared, and small supplies of stock may be obtained; no fuel is to be procured, and most of the meat and charcoal are derived from Asia Minor; water is scarce.

Gaidaro Islet, off the northwestern end of Piskopi, is ¾ mile in length, bold, 447 feet high, and separated from Spano Point, the western horn of Plagio Bay, by a deep and clear channel ½ mile wide. Two rocks, above water, lie close to the west coast of Piskopi about ¾ mile southward of Spano Point.

Plagio Bay, at the northern end of the island, is open to the northward, and at its head is the skala, half an hour's walk from Tilos, the chief village, which, entirely hidden from the anchorage in Plagio Bay, contains about 125 houses and stands on the side of a steep hill facing south. Vessels requiring cargoes lie off the skala in 8 or 10 fathoms, sandy bottom, but it is not advisable to anchor here if it can be avoided, as the holding ground is not good, and a swell, attended by a current, frequently sets in before a northerly wind, which renders it difficult for a sailing vessel to get out. The entrance points should not be approached too near, and the eastern shore of the bay is skirted by rocks.

Digitized by Google

Livadia Bay, on the northeastern coast of Piskopi, is considered the safest anchorage, though exposed to northeasterly winds. It is bordered by a bank, and in the middle of the bay the water is rather deep, but there are anchoring depths near its head, and a berth will be found in 11 fathoms, good holding ground. During summer vessels lie here with a hawser to the eastern shore. The little islets of Prasuda and Gaidaro Nisi lie close to the shore, northwestward of the bay; they are surrounded by shoal water, and there is no passage inside them.

Piskopi Head, the eastern extremity of the island, rises from deep water, and nearly ½ mile within it the land is 1,620 feet high. The 100-fathom curve of soundings passes round the head at a distance of less than 400 yards.

A sunken rock lies close off Kinduno Point, the southern extremity of Piskopi, and shoal water extends nearly 400 yards southward from Kavo Pelagusa, the point next westward of it.

Megalo Bay, on the southwestern side of the island, is about 1½ miles deep, but entirely open to the southward. At its head there are anchoring depths in 16 to 12 fathoms, sand, but inside the latter depth the bottom is foul. The shore at the head of the bay is bordered by a bank. A little islet, named Agios Andreas, lies off the western point of entrance and a reef of rocks extends nearly 400 yards southward from Kavo Maru, the eastern point.

Anti Tilo (or *Askino Nisi*) is 1½ miles in length northeast and southwest, narrow, high, and steep-to all round. It is separated from the southeastern end of Piskopi by a channel 1.6 miles wide and 150 fathoms deep. The passage between Anti Tilo and Khalkia on the south is nearly 8 miles wide, clear and deep.

Niseros (ancient *Nisyros*), in the form of a pentagon, 4 miles across, is composed of rocky volcanic mountains, and a long irregular creater occupies a large portion of the center of the island. The edges of the crater rise generally from 1,350 feet to 1,874 feet above the sea, but a small crater to the westward, the greatest elevation of the island, is 2,270 feet high. Sulphur is found in the large crater, the bottom of which forms a small plain only 455 feet above the sea. The sides of the island are precipitous, with terraces to the top in order to keep the earth from washing down in the rainy season. The groves of almond trees, vineyards, etc., present a picturesque appearance from the sea.

Mandraki, the chief village, near the site of the ancient town of Niseros, at the northwestern point of the island, is dirty, but the ruins of the ancient fortifications on a point southwestward of it, give it an appearance of consequence which a nearer inspection dissipates. There are two other villages, Imbori and Nikia; the latter, erected on the extreme edge of the crater, is about an hour's walk from some hot springs at the southeastern extremity of the island.

Digitized by Google

Niseros is tributary to Rhodes, and the population, amounting to about 2,500, are civil and industrious. There are neither mules nor horses on the island, but only a breed of small asses, on which and men's shoulders everything has to be carried. The produce consists of almonds, olives, figs, wine, and valonia.

There is no port or anchorage for large vessels, but the skala is at a slightly projecting point on the northern side about 1¾ miles eastward from Mandraki, and vessels occasionally drop an anchor off it in fine weather during summer, but if they require to remain in the vicinity they anchor in 3 or 4 fathoms, sand, on the southeastern side of Yali. The shores of Niseros are bordered here and there by scattered rocks, but they do not extend far off.

As may be expected from the nature of the island, there are many hot springs the most important being at Cape Lutros, its southern extremity, where the villagers assemble to wash their linen and bathe. Under Petrodi Point, the southwestern end of the island, are some hot air caves.

There are two large thermal bathing establishments on the north coast of the island, one at the eastern end of Mandraki, and the other near Skala.

Anchorage can be obtained in a depth of 16 fathoms at about ¼ mile eastward of Mandraki, and 300 yards from a small pier in this locality.

Supplies.—Provisions are scarce, and water is all preserved in tanks.

Communication.—There is fortnightly steamer connection with Smyrna by the Pantaleon Co.

Rakhia or Pasha Islet, about 1¾ miles westward of Petro di Point is more than 1 mile in length and 350 feet high. At a little less than ½ mile northeastward of its eastern point is a small rocky shoal with only ½ fathom water on it, and difficult to see; and at about the same distance northward of Petrodi Point, Niseros, is a similar shoal. There is deep water inside both shoals, and the passage between them is clear and 1¼ miles wide. These shoals are the only dangers in working between Rakhia and Niseros; and in standing toward the former do not open Strongyli Islet more than half its breadth of the northwestern part of Niseros, bearing 30°, until well northward or southward of Rakhia Islet. With a fair wind keep in mid-channel.

Rigusa, or Perigusa, northwestward of and similar to Rakhia, but only 235 feet high, is bordered by shallow water and rocks. In a bend of the shore on the eastern side of Rigusa a small vessel might drop an anchor, but close in, during westerly winds. The passage between Rakhia and Rigusa is 1 mile wide, and, with the exception of the shoal ground bordering the latter islet, is clear and deep.

Yali (or *Ialos*), northwestward of Niseros, is nearly 3 miles in length northeast and southwest and consists of two portions united

Digitized by Google

by a low isthmus about 300 yards across, the northern portion being 580 feet high. The coast is irregular and bordered by shallow water and rocks, which on the southeastern side extend off ½ mile. A little islet southward of the northeastern part, known as Agios Antonios, is joined to Yali by shoal ground; ¼ mile southward of the islet is a rock with less than 1 fathom water on it, and between is a depth of 32 fathoms.

Rock.—At about 800 yards, 221°, from the southern point of Yali is a small rocky shoal with ½ fathom water on it and 10 fathoms between it and the point. When in the vicinity of the point, the northeastern extremity of Yali bearing 35°, open eastward of Agios Antonios will lead eastward of the shoal.

Strongyli, a small circular islet about 600 yards in diameter and 410 feet high, lies 1.6 miles eastward of Yali, and between the water is from 25 to over 100 fathoms deep. The passage between the northern end of Yali and Kos Island is 4½ miles wide, deep and clear, though the coast about Andemaki Point, Kos Island, is foul and should be given a reasonable berth.

The current runs strongly round Niseros and the surrounding islands at uncertain times and in various directions.

Symi.—This island (ancient *Syme*) lies at the entrance of the Gulfs of Doris and Symi. It extends about 6¾ miles north and south and 5½ miles east and west, but it is most irregularly shaped, its coast being indented with numerous bays and inlets. Symi, the only town in the island, stands on an acclivity above the skala in the harbor, which is a nook or basin about ¼ mile north and south and 300 to 400 yards wide, with a narrow entrance, on the southern side of the bay of the same name, at the northeastern end of the island.

Industries.—The inhabitants, amounting to about 8,000, nearly all live in the town and are chiefly occupied with the sponge fishery, which employs about 150 boats and a dozen small vessels. The island is the head depot for European manufactured goods, which are thence exported throughout the Sporades; it is also tributary to Rhodes.

Symi Harbor is inclosed by steep mountainous land about 1,800 feet high, and the water is deep, there being 24 fathoms in the middle. It is much frequented by vessels of 200 to 300 tons. An anchor is dropped near the center, and the vessels then haul alongside the quay which runs round the harbor, where there are bollards for making fast. The larger vessels lie on the western and the sponge boats and the small craft on the eastern side. The harbor is so small that during the winter months there is scarcely room for the number of vessels that lay up here. A mooring buoy belonging to an English company lies in 24 fathoms water. Vessels should enter with caution.

Communication.—Steamers of the Pantaleon Co. call fortnightly and those from Smyrna to the Syrian coast call weekly.

Digitized by Google

Symi Bay is 2¾ miles deep and except at Nemborio Bay, in the southwestern corner, averages about 1 mile in width. The water is deep, but off the sandy beach at the head of Nemborio Bay there are from 14 to 20 fathoms. Nemborio is separated from Symi Harbor, eastward of it, by a rocky projection about ½ mile across.

Nimos Island, close northward of Symi, is nearly 2 miles in length east and west and its southern side forms with the northwestern end of Symi, to which it is connected by a reef, the northwestern side of Symi Bay. Skilo Rock, above water and steep-to on the outside, lies close to the eastern end of Nimos; on the western side of Nimos is the islet of Kondros, southward of which, off the coast of Symi, are the islets of Plati and Oxa.

Pethi Harbor, on the eastern side of the island and ¾ mile southward of Symi Bay, is also a snug little port with a narrow deep entrance open to the northeastward. Within the entrance there are from 18 to 5 fathoms water, good holding ground, with sandy beaches. Here are some remains of a castle and of Cyclopean walls. When off this harbor the town of Symi, some windmills, and a circular building will be seen on the hill westward of its head. It is said that this harbor is better and more convenient than Symi or Nemborio Bay.

Supplies.—Supplies of beef and bread can be obtained from the town of Symi, which is less than 1 mile from the anchorage.

From Pethi Harbor to the southern end of the island, a distance of nearly 6 miles, there are several bays formed between the spurs or ridges of the highland. These bays are all open to the eastward, having deep water, and of no importance.

Paniero Harbor, on the western side of the south end of Symi, is an oval basin ½ mile in length, ith 5 fathoms water just within the entrance and shoaling to ½ fathom. It is sheltered from all winds, and is a convenient port for small vessels, though it is said the bottom is indifferent holding ground. The entrance is about 200 yards wide, and on the southeastern side of the bay is the monastery of Panormiotes, inhabited by a few Greek monks. There is nothing to be obtained, as the inmates of the monastery are the only persons here, and all necessaries have to be brought from the town of Symi in boats, as the road is over steep, rugged land.

In proceeding for Paniero Harbor give Patos Point, a tongue-like projection southward of it, a reasonable berth, as it is surrounded by rocks, then keep the southern shore aboard until the entrance is open.

Seskli Island, off the southern end of Symi, is about 1 mile in length east and west and ¾ mile in breadth; its eastern point is bordered by rocks above water. Trambeto Islet lies off the southeastern and another islet off its western side. The passage between the island and Symi is about 800 yards wide, clear, deep, and called Seskli Strait.

Digitized by Google

Yavales Islets.—The western coast of Symi is rugged and irregular, with several bays and projecting points. At the central part of the coast is a ragged, irregular projection, and from it a chain of four rocky islets extend 1¾ miles southwestward, called Yavales Islets. The outer islet is known as Marmara Islet, and is separated from the rest by a passage 700 yards wide having a depth of 16 fathoms in mid-channel. The three northern islets are closer together and skirted by rocks; rocks also extend off from the southern side of Marmara, and the 100-fathom curve of soundings is less than ¼ mile outside it. There is nothing to be gained by rounding Marmara Islet closely, and it should therefore be given a reasonable berth.

Cape Alupo (ancient *Kinossima Promontory*) is the southern extremity of a long narrow peninsula projecting southwestward from the mainland and which separates Rhodes Channel from the Gulfs of Symi and Doris. The shores of this peninsula (which is covered with ancient and Middle Age ruins) from Cape Alupo to Cape Marmarice, its eastern extremity, a distance of nearly 20 miles, are steep and rugged, with a range of limestone mountains at the back averaging 1,500 feet in height.

Rocks.—A sunken rock lies at the foot of Cape Alupo, and it should be given a reasonable berth in rounding.

Port Aplotheka is situated nearly 2 miles to the eastward of Cape Alupo, the coast between forming several bold projecting points. The port extends ¾ mile in a 322° direction, and, although deep at the entrance, has good anchorage in any convenient depth toward the head. A rock above water lies close to the shore just within the western point of entrance, and sunken rocks lie at the foot of the eastern point of entrance; the interior of the harbor is clear. The ruins of a large fortress mark the summit of a rocky barren ridge rising over the head of the port.

Supplies are limited and not to be depended on, and the only water to be obtained is brackish.

Ipsera Island.—From the southeastern entrance point of port Aplotheka the coast trends eastward ½ mile to a point, close off which are several rocks and an islet; ¼ mile southward of the point is Ipsera Island, separated from the islet just mentioned by a passage about 200 yards wide and having a depth of 10 fathoms in mid-channel.

Port Sertcheh.—From Ipsera Island the coast trends northeastward 1¼ miles to the entrance of the small port of Sertcheh (ancient *Sersa*), which is only available for small vessels.

For a continuation of the description of the southeastern coast of this peninsula, see page 525.

Gulf of Symi.—Cape Volpe (*Kavo Noria*), 3.1 miles northward of Cape Alupo, is the northwestern extremity of the peninsula of

Digitized by Google

which the latter is the southern extremity. The coast between the two capes is rugged with a central projection on the northern side of which is a bay with a small cliffy creek and some ruins, named Karamaki. Cape Volpe is bordered by shoal water which is steep-to, and it should be given a reasonable berth in rounding.

Cape Volpe is 3¾ miles from Symi Island and forms the southern point of entrance to the Gulf of Symi, the northern point of entrance being Cape Apostoli, 4½ miles northward. From the line joining these two points the gulf is 6½ miles deep, with several islands and bays near its head. Along the southern shore are the little islets of Miniko, Petro, Aulaki, Plati, and Makri. The water is deep on either side of the two former, but there is no vessel passage between the three latter. A vessel may pass into Saranta Bay, northward of Aulaki, or southward of Makri Islet. Mount Kara Esek, southeastward of the islets, is 1,780 feet high; northward of the mount are large ancient ruins.

A rock above water and a sunken one outside it lie off the entrance of a little cove southwestward of Miniko Islet.

Saranta Bay, in the eastern part of the gulf, is formed by a southerly projection of the land, off which is the island of Karmari, lying in the same direction and united to it by shoal ground. At the head of the bay is the village of Saud, or Saranta, and on a hill southeastward of it are the remains of an ancient fortress. On the eastern side of Saranta Bay the shore in one or two places is bordered by shoal water, and a sunken rock lies a little off the shore at the head of the bay, with others near the eastern side of Karmari Island, about ½ mile from its extreme southern point. The islets of Aulaki, Plati, and Makri front the bay southwestward.

On the northwestern side of Karmari Island is the island of Lebunia, about ½ mile in length, connected to Karmari by a shoal, and at its western end are two little islets and a sunken rock, with deep water near them. Lebunia covers a bay on the north, but the water in it is too deep for ordinary anchorage.

Vunos Island, 1¼ miles in length north and south, covers the approach to Badalena Bay. Its northern end is about 200 yards from the northern shore of the Gulf of Symi, and this narrow passage with rocks on either side carries from 2 to 3 fathoms water.

Badalena Bay runs in more than 1 mile to the northward, with an average breadth of about ½ mile, and is landlocked. The water is rather deep at the entrance, but inside a small islet with some ruins on it the depths are from 10 to 18 fathoms. At the northwestern part of the bay the water shoals off from a small projection nearly 400 yards. There are some houses and a water mill on the eastern shore, and over the head of the bay northeastward are the remains of a medieval fortress.

Digitized by Google

The vessel passage to Badalena Bay is round the southern end of Vunos Island and northward between Agia Varvarah Islet, with ruins on it on the west, and the eastern point of entrance; thence eastward of the small islet with ruins on it. The water in mid-channel is deep, and the only danger to be avoided is the shoal bordering the northwestern part of the bay.

Cape Apostoli.—At about ¾ mile westward of Vunos Island is the little islet of Khaskos, separated from a sandy beach on the north by a narrow passage with 1½ fathoms water. At 2.3 miles westward of the islet is Cape Apostoli, the termination of an irregular promontory, which, like the peninsula on the southern side of the Gulf of Symi, has numerous medieval ruins on it. At about 800 yards eastward of the cape is a little cove, with 10 fathoms at its head; rocks extend off both points of entrance, and are steep-to. Cape Apostoli is nearly 5 miles eastward of Nimos Island, off the northern end of Symi Island, and both are on the southern side of the Gulf of Doris.

Age Latha.—This dangerous patch of rocks, barely above water and steep-to, lies about 700 yards 232° from the southwestern extremity of Cape Apostoli, with from 30 to 45 fathoms water between. At night the cape should be given a wide berth.

Mesia Bank, with 9 fathoms on it, lies 1.3 miles 289° from the cape.

Gulf of Doris.—Between Cape Apostoli and Orta Point, bearing from it 331°, the distance is 4½ miles, and from this line the Gulf of Doris and Arineh Bay (Gulf of Renas) run in 10¾ miles. From the cape the southern shore of the gulf is irregular and forms several little bays fronted by five islands or islets known as Nisia Kalopothia. The first three of the islets, Oneah, Ikinji, and Mikale, are small, and two rocks above water extend from the northern end of Oneah. The point of the coast southward of this latter islet is foul. The water round the islets is deep, and there are narrow passages through them and between them and the shore.

Kaloyeri and Karamea, the two eastern and largest islands, are each about 1 mile in length, and partially cultivated. The water between them is deep, but the southern end of the former is bordered by a shoal, and likewise the point of the mainland southward of it, but the narrow pass between has 15 fathoms water in mid-channel. The southern side of Karamea Island is skirted by rocks, but the passage between it and the coast, with the exception of a large rock above water within the eastern entrance, is clear and deep. On the main, opposite the opening between Kaloyeri and Karamea Islands, and on the eastern side of the eastern bay are conspicuous bold precipitous cliffs. The scenery here is grand and imposing.

Digitized by Google

The northern shore of the gulf is not so deeply indented, but barren, of a reddish color, and forms a strong contrast with the opposite coast.

Losta Bay, at the termination of the cliffs, on the southern shore previously mentioned and eastward of Karamea Island, extends about 2¼ miles southeastward and opens out upward of 1 mile southwestward, where it averages ¾ mile in breadth, and takes the name of Port Losta. The bay affords a most attractive view; on the northern side are ancient ruins and the remains of a castle on the summit of a hill. At the head of Port Losta are some houses, a water mill, and the remains of another medieval fortress.

Dangers.—In entering Port Losta a rock with ½ fathom water over it lies ¼ mile inside the western entrance point, while at the same distance 232° from the eastern entrance point is a large rock or islet with shoal water extending from it southward, with 10 fathoms inside it; elsewhere the water is deep.

Arineh Bay, or Gulf of Renas, in continuation of the Gulf of Doris, is 3¾ miles deep, and for 1½ miles within it is only 1 mile wide, when it opens out, with bays or indentations on either side, a semicircular sandy shore at its head, and anchoring depths in every part of it. The little islet of Koraka, skirted on the northward by rocks, lies close to the shore at the southeastern point of entrance; the larger islet of Thiaspori, also bordered by rocks, lies at the northwestern point of entrance, covering a little bight formed by a projecting tongue of land northwestward, the southern termination of which is called Pinnacle Point.

Sunk Rock.—At 600 yards 210° nearly from Pinnacle Point is Sunk Rock, with 1 fathom on it and deep water round it. The northeastern point of the bay next northeastward of Thiaspori Islet, in range with the southeastern extremity of the islet bearing 43°, leads southeastward of Sunk Rock.

The northeastern part of Arineh Bay, between Port Kiervasili and two sandy coves northwestward, is mainly a circular beach, with from 8 to 16 fathoms water, muddy bottom, off it. In the middle of the beach the Erchuse Chai runs into the sea. There are several ancient ruins in the vicinity and on the eastern side a medieval fortress.

Arineh town (*Assareneh*) is about 1¼ miles in from the eastern shore.

Port Kiervasili is a narrow inlet running 1½ miles south-southeastward from Arineh Bay, the average breadth being about 700 yards, but about 1,400 yards in it is contracted by an islet which is united to the western shore by shoal water; the depths decrease from 17 fathoms at the entrance to 5 fathoms at the head. The eastern shore is mainly a beach bordered by shallow water, with a lagoon

Digitized by Google

at the inner part; within it are scattered remains of the Middle Ages, and northwestward of the elevated land of Arin Dagh are the ruins of an ancient temple and a theater. The village of Kiervasili is about ¾ mile eastward from the inner part of the port, and from it a road leads to Marmarice Harbor.

Pedalo Bay, westward of Port Kiervasili and separated from it by a tongue of land, the extremity of which is skirted by rocks, is nearly ½ mile deep, having a beach at its head, with from 10 to 14 fathoms water; its western side of entrance is also bordered by rocks.

Penzik.—This narrow inlet, westward of Arineh Bay, leads up to the Dorian Isthmus. Its entrance is fronted by the little islet of Kofinitha, from which a reef extends northward 300 yards, with 15 fathoms water in the narrow passage between it and the northwestern shore; on the eastern side of the islet, with the exception of Sunk Rock previously mentioned, the passage is clear. The inlet extends north-northeastward 1¼ miles and carries from 15 fathoms water at the entrance to 2 fathoms at its head, but on the western shore about halfway in is a sunken rock.

The Dorian Isthmus is about ½ mile across, as in the days of Herodotus, and small boats are occasionally hauled over it.

It was attempted in ancient times to cut through the Dorian Isthmus, but the workmen were so obstructed by the peculiar nature of the ground that they imagined it to be the interference of some supernatural power, and the inhabitants of the promontory sent for advice to the Pythian oracle at Delphos, who declared that if Heaven had intended it for an island it would have been one. The attempt was therefore laid aside, but the isthmus was fortified by a wall, the tower and remains of which a few years ago were to be seen. The ground appears to be of volcanic origin, and composed of a calcinal crumbling rock, somewhat resembling flint or rather vitrified stone.

Dorian Promontory (or ancient *Triopium*), separating the Gulfs of Doris and Kos, is a long tract of land, irregular in shape, of considerable elevation in places, and at the Dorian Isthmus and Datcha Bay nearly divided into islands by the waters of the two gulfs. The promontory extends westward about 35 miles from the mainland, varying in breadth from about ½ mile to 6½ miles, with several coves or bays along its southern side. A high mountainous ridge runs through its center as far as Datcha Bay, when it gradually falls, but rising again to the westward forms a great mass which reaches an elevation of 3,850 feet above the sea.

Shoals.—A shoal with 1 fathom water on it lies close to the eastern side of entrance to Lintos Bay; at about 1,200 yards southwestward of the eastern point of Lintos Bay is another shoal with 5 fathoms on it.

Digitized by Google

Kochini Bay (*Kato Armakitha*) is about 6½ miles westward of Penzik Inlet; the coast between is irregular, and forms several little bays and coves.

Orta Point, on the eastern side of entrance to Kochini Bay, has a rocky shoal at its foot, and between the point and Kara Point on the west the bay falls back nearly 1 mile northward, but on its eastern side is a group of small islets or rocks, steep-to, and which contracts the passage to about ½ mile. There is anchorage in the western part of the bay in 15 fathoms, mud bottom, or farther in if necessary.

Kara Point is the extremity of a small promontory connected to the main by a sandy isthmus; the promontory divides Kochini Bay, on the east, from Ano Armakitha Bay, on the west. A small islet surrounded by shoal water lies off the southwestern extremity of the promontory, and from the eastern side of Ano Armakitha Bay shoals extend one-third its breadth across.

Water.—Ano Armakitha Bay is nearly 1 mile deep, with a circular sandy shore at its head, and here a small stream of good water runs into the sea.

Gull Rock.—This rock, 8 feet above water, is the outer of a cluster of little islets or rocks extending from rocky points over a distance of about 1¼ miles, in the vicinity of which are medieval ruins. Gull Rock is steep-to, lies about 4 miles westward of Ano Armakitha Bay, and on the eastern side of the entrance to Datcha Bay.

Datcha Bay.—From the western of the rocky points just mentioned rocks above and below water, with ancient ruins on them and deep water close-to, extend in a southwesterly direction nearly ¾ mile. Close to the westward of these rocks is the islet of Aiak Adasi, 800 yards in length, and skirted by rocks. From the rocky point a sandy shore curves round to the west and southwest, forming Datcha Bay, which is about 3½ miles wide and 1 mile deep, with depths of from 6 to 25 fathoms, muddy bottom, affording well sheltered anchorage from all winds from southwest round northward to east.

The land in the vicinity of the bay is partially cultivated. On the western side a small stream runs into the sea, and south of the stream are large ancient ruins on the point separating Datcha and Chatalia Bays. The town of Datcha stands on rising ground 1½ miles inland to the westward, and the customhouse is in a little cove in the southern part of Chatalia Bay, and off which there is anchorage for small vessels.

The Dorian Promontory at Datcha Bay is contracted to a little over 1 mile across, and the elevated ridge which rises over the coast eastward culminates northeastward of the bay in Mount Emeji, 2,440 feet high and ¾ mile from the southern shore of the Gulf of Kos.

Digitized by Google

Ata Islet.—A small isolated islet or rock, named Ata or Plati, with sunken rocks at its base and deep water close to, lies nearly ¾ mile southeastward of the southern extremity of Datcha Bay, and there are from 25 to 5 fathoms between it and the shore.

Injah Point (Cape Kalosuru), a narrow tongue of land ½ mile in length projecting southeastward, is the southeastern termination of the high mountainous mass which forms the western part of the Dorian Promontory. The point is steep-to, the 100-fathom curve of soundings being only 400 yards from it.

Baba Island.—The island of Baba, or Barba Nikola, lies 8 miles westward of Injah Point. The coast between is irregular, and some of the projecting points are bordered by rocks. The highland 3 miles in the interior reaches the height of 3,850 feet above the sea. Baba Island is rather more than ½ mile in length north and south, and, with the exception of a sunken rock close to its southern end, is clear all round.

Epano Georgios.—Northward of Baba Island is Epano Georgios, a semicircular bay with a beach on its western side, off which and northwestward of the island vessels frequently anchor during northerly winds in from 10 to 17 fathoms water, sand and mud, or mud bottom.

Cape Krio.—At 1½ miles westward of Baba Island is Cape Palamida (*Dibar Ban*), a clear and well-defined headland, and 6 miles farther west-northwestward is Cape Krio, which with Tekir Point forms the western termination of the Dorian Promontory or ancient *Triopium Promontorium.* The cape at a distance makes like an island, being only connected with the main by a low, narrow isthmus. The coast of the cape consists of steep cliffs, and the land 2 miles within is 1,810 feet high. The water in the vicinity of the cape is everywhere deep.

Artificial harbors were in ancient times constructed on both sides of the isthmus. Trireme Harbor, the northwestern, is small and now very shallow, having only from 2 to 4 feet water, and there are also 4 feet in the entrance, which is about 26 yards wide.

Port Phriano, the southeastern, is larger and deeper, the outer part having from 12 to 5 fathoms water, but the inner part is shallow. It was once protected by two substantial piers, which left an entrance 160 yards wide, but now narrowed to about 130 yards. The southwestern pier, constructed of immense stones cramped together, is yet in a fair state of preservation, well above water, and extends into a depth of 9 fathoms. The opposite mole has been demolished by the swell, but its remains may be traced by the wash, and, occasionally, parts of it show above water. In case of necessity, small vessels will find shelter in this little harbor, or a large vessel to pre-

Digitized by Google

vent sinking might be placed on the beach. In entering it is advisable to keep nearer the southwestern pier.

Cnidus.—It is said of Cnidus that there is hardly any ruined Greek city in existence which contained specimens of Greek architecture in so many different branches. Besides the artificial harbors a few years ago there were to be traced remains of the city walls, a celebrated temple of Venus and two others, artificial terraces for public and private buildings, theaters, and a multitude of other ruins. The Acropolis is on a hill 933 feet high, over the northeastern angle of the city. To this day traces of the ruins are very distinct and well worth a day's examination.

Coast.—Tekir Point, projecting northwestward, is nearly 1½ miles northward of Cape Krio, and there are upward of 50 fathoms water within ¼ mile of it. Between the point and Kuchi Islet, 3 miles northeastward the coast falls back and forms a deep bay, called Tekir Bay. Kuchi Islet is about 1,200 yards in length and separated from the main by a deep and clear channel 400 yards wide, but the northwestern end of the islet is surrounded by shoal water. Between Kuchi Islet and Mersinjik Bay, 4 miles farther northeastward, the coast is irregular, with two little bays, and the salient points are foul.

Mersinjik Bay is ½ mile deep, with a beach at its head, close to which is the village of the same name. There is a small cove on the western side of the bay, where coasters at times wait for cargo from the neighboring villages. The elevated land southward of the bay is 2,580 feet high.

Mordala Islet (*Moordavan*), about ¼ mile in length and foul at each end, lies ½ mile from the coast westward of Mersinjik Bay. At 400 yards southeastward of the islet is a large rock above water, but the passage between is deep and there are 35 fathoms midway between the rock and the mainland.

Kos, known to the Turks as Stanko, is an island 23½ miles in length in a 244° and 64° direction, with an average beadth of 4½ miles, though near its western end it is contracted to a little more than 1 mile across. It is mountainous, especially on the south and west. An elevated ridge extends along the southern side of the island, which at rather less than one-third its length from the eastern end is 2,870 feet above the sea; the height at the western end is 1,390 feet. The eastern portion of the northern side of the island is composed of a large tract of level and fruitful ground, which produces corn, silk, and wines; fruit trees everywhere abound. The population of the island amounts to about 9,500, mostly Greeks; the Turks are congregated in the town and the Greeks in the villages, of which there are several throughout the island.

Digitized by Google

The town of Kos stands picturesquely on the site of the ancient city, on the shore of the semicircular bay at the eastern end of the island, and in its vicinity are groves of orange, lemon, pomegranate, fig, and other trees of the Levant. On the northern side of the town is a castle erected at different dates, but chiefly by the Knights of Rhodes; the walls are whitewashed and from 30 to 40 feet high, and on the northern side of the castle is a narrow entrance into a lagoon having from 1 to 2 fathoms water. There is also a battery, not visible from seaward, on Myli Point, to the eastward of the town. The anchorage is northeastward of the castle in 10 or 11 fathoms water, mud and weed, or in any convenient depth. There is no other port or anchorage in the island.

Vessels bound through Kos Channel should be careful in rounding the eastern end of Kos Island, in twilight or at night, to avoid the low sandy point named Luro, southeastward of the town; it is difficult to distinguish, and, as the water can not be seen over it, a mistake might easily be made.

Light.—A fixed red light, visible 3 miles, is erected on the head of the landing pier off the parapet.

Communication.—Steamers of the Pantaleon Co. and Syrian Line call weekly.

Kum Point, the northern extremity of Kos Island, is low, sandy, and surrounded by shoal water which extends northward fully ¾ mile.

Two-fathoms Rock, with that depth of water over it, is 300 yards in length northeast and southwest, the center of which bears 345°, distant ½ mile from Kum Point Lighthouse. Depths less than 5 fathoms will be found ¼ mile northward of this shoal spot. As the shoal is steep-to, and no satisfactory marks can be given for clearing its extremity, it should be given a wide berth in passing.

Light.—At about 165 yards within Kum Point is a white house with a mast on it, from which is exhibited, at an elevation of 59 feet above the sea, a fixed red light, visible 6 miles.

This light, with the fixed white light on Hussein Port northward of it, marks the Kos Channel at night. (See Light List.)

Kappari Channel (*Pserimon Bogazi*).—The northern coast of Kos is bordered by shoal water, which, abreast of Cape Russa of Kappari Island, extends northward beyond ¾ mile and nearly into the middle of Kappari Channel. Vessels should keep rather on the Kappari side, where the water is deep.

Gulf of Kos.—This gulf takes its name from the island of Kos, which lies at the entrance, dividing it into two channels of unequal breadth, the northern and narrower called the channel of Kos, being about 2¼ miles wide, while the southern, or that between Kos and the Dorian Promontory, is a little more than 7 miles wide. From

Digitized by Google

the island of Kos the gulf extends 50 miles in an easterly direction, the larger portion being about 12 miles in breadth, but its inner part, called Giova Bay for the last 6 miles forms a peculiar canal-like shape and is from 3 to 1½ miles wide. The water in the gulf is of great depth, gradually decreasing, however, toward the eastern end, where it is available for anchoring.

Aspect.—The scenery is magnificent. The inner part, bounded on the north by precipitous mountains, falls in a series of cliffs nearly to the water's edge. On the southern side there is a succession of broken hills and deep ravines, with small patches of cultivable ground, in places well watered, and covered with luxuriant vegetation.

People.—There are but few inhabitants or villages near the coast, which is only visited at certain periods by husbandmen or shepherds; but the numerous remains of both ancient and modern buildings prove that in former times it must have been densely peopled.

Malaria.—In the summer months, from June to October, or in some seasons even before this period, the gulf, at the upper part particularly, is abandoned by the few inhabitants in order to escape sickness, which, combined with the absence of fresh water, may account for the scantiness of the population.

In all the small ports or islets on the southeastern side of the gulf, where alluvial deposits have extended the mouths of the small streams which run into the sea—the care necessary to keep them clear being wanting—they have become in most instances a pestiferous swamp, the exhalations from which are most prejudicial to human life and perhaps form an additional reason why the secure and beautiful harbors in that part of the gulf are untenanted.

Water.—There appears to be a great want of fresh water on the coast in every part of the gulf, and although the Turks have tried to remedy the evil by constructing large and solidly built tanks in almost every small nook along the northern side, yet, from the scarcity of inhabitants, the channels which feed them from the sides of the hills are not kept clear, and therefore the supply which should run into them during the rainy season, is wasted; consequently they are generally empty or the water is bitter and unwholesome.

The streams which water the small plains find an outlet in the low marshy ground in the ports and inlets, but owing to the flat nature of the land are salt some distance in, and can only with difficulty be made use of for watering by carrying barricoes or small casks up the valleys.

Winds.—The winds in the gulf are irregular, but during summer land and sea breezes have been experienced.

Coast.—From Mersinjik Bay the northern coast of the Dorian Promontory trends east-northeastward 8½ miles to Cape Shuyun (*Shah-hin Burnu*), projecting from the highland, elevated 1,140

Digitized by Google

feet, 1½ miles within it. The high mountainous land within this part of the promontory is from 2,580 to 3,850 feet high. The coast from Cape Shuyun trends eastward to the creek of the Dorian Isthmus, a distance of 19 miles, forming a succession of small sandy bays with low rocky points, the land gradually rising within to the elevated ridge which runs through the eastern part of the promontory.

Mount Emeji, a bold rocky elevation 2,440 feet high, is nearly 1 mile inland; its extremity forms Cape Emeji, 8½ miles eastward of Cape Shuyun.

Shoal.—At 3½ miles eastward of Cape Emeji, are three points, named Uch Chatal; ¾ mile beyond the eastern is a rocky shoal with 1½ feet water on it. The shoal is nearly 700 yards in length within the depth of 5 fathoms and about the same distance from the shore; between there are from 5 to 18 fathoms water.

Anchorage.—There is no anchorage anywhere along the coast, though here and there close inshore a vessel with steam power might drop an anchor for temporary purposes with offshore winds.

Murdubek Bay, in the southeastern part of the Gulf of Kos, is about 2½ miles deep and 2 miles wide, with one or two little bays, the salient points of which are foul. There are anchoring depths round the inner part of the bay, but it is open to the westward and there is no shelter except with offshore winds. Dorian Creek, in the southern part of the bay, has only accommodation for small vessels; a sunken rock lies off its eastern point of entrance.

From Murdubek Bay the whole coast north and eastward is wild, broken, and indented with numerous bays and inlets with projecting points.

Atmak Point.—Morghebet Point, on the northern side of the entrance to Murdubek Bay, is surrounded by shoal water. At 1 mile northward of it is an irregular tongue of land projecting 1,200 yards seaward, and also foul, named Atmak Point. Between the two points is an inlet nearly 1 mile deep, converging to its head, where a stream runs into it.

Shoal.—Northwestward of Atmak Point is a shoal more than 300 yards in length northwest and southeast, on which the sea breaks. It is separated from the shoal ground surrounding Atmak Point by a passage about 200 yards wide, with 10 fathoms water in mid-channel.

Yedi Atala Islets.—Between Atmak Point and Koyun Cape, 3½ miles 14° from it, the coast forms a bight 2 miles deep, and in the southeastern part is a chain of four islets, named Yedi Atala, extending over a space of more than 1½ miles and covering an area within sufficiently large for several vessels. A con-

Digitized by Google

venient anchorage is inside the third islet counting from the northeastward and off the entrance of a little creek. The channel in between the second and third islets is narrow, and a reef runs off from the southwestern end of the second islet, but it can be seen. There is no vessel channel between the western islet and the next one. The entrance to the little creek just alluded to is less than 100 yards wide; there are 13 fathoms in it, and though there is room for a small vessel there is no inducement to enter.

Rock.—Vessels intending to anchor in either of the bays southward of the islets can enter by the western channel, though there is an awkward rock in the center, with 2¾ fathoms water on it, which can, however, be avoided by keeping near the western islet. The shore on the southern side of the channel is shoal, and the passage southward of the 2¾ fathoms rock is not recommended. The best anchorage is in 15 fathoms, nearly in the center of the western bay.

Three-foot Rock.—This rock, 3 feet under water, is difficult to see, as it forms a pinnacle on which the sea never breaks. It lies with the center of the islet in the middle of the bight and northward of the Yedi Atala Islets, bearing about 165°, distant from the islet 400 yards. The rock also lies on the line joining the islet to the bluff, cliffy point on the north. There are 38 fathoms water 100 yards westward of the rock.

Karamuk Rocks.—Between Cape Koyun (northward of Yedi Atala Islets) and Cape Balisu, 1¼ miles farther north, the coast forms another bight, 1 mile deep; at nearly 700 yards off the southwestern face of Cape Balisu is a danger named Karamuk Rocks, with less than 1 fathom water on them, about 400 yards in extent, with 7 fathoms water between them and the shore. Balisu Bay, on the northern side of the cape, more than 1½ miles deep, is open to the westward, shallow at its head, and affords no anchorage.

From Lunguiz Point, on the northern side of Balisu Bay, the Gulf of Kos narrows considerably, being here only about 5 miles wide, and hence to its head takes the name of Giova Bay.

Port Deremen (*Deremen Buki or Mill Creek*).—The entrance to this port is 4¾ miles eastward of Lunguiz Point, the coast between forming three bays or inlets, with patches of rock and shoal water round the salient points, but there are no off-lying dangers. Port Deremen has two unequal arms running southward; the westernmost, called Port Gharb, is narrow and ¾ mile deep, with from 7 to 17 fathoms water, but of no use except in case of necessity.

The eastern arm, Port Deremen proper, is more commodious, though narrow and indented with creeks on either side; it is a little more than 1 mile long, with depths of from 5 to 17 fathoms, mud bottom.

Digitized by Google

The entrance to Port Deremen is between Gharb Point on the west and Pelid and Dairi Islets on the east; the latter islet, the larger of the two, is 150 feet high and 800 yards southward of the former.

Water.—At the head of this arm there is much swampy ground and three streams which run into it are lost. By carrying barricoes up the small valley in the southwestern corner a little water may be procured.

Products.—The trees on the low ground between the hills near the mouth of the streams produce great quantities of gum storax, which is annually collected and exported to Italy for fuel.

The tree, which only grows in the rich alluvial soil about the mouths of the small streams, much resembles the sycamore in appearance and emits a most delicious perfume. The few men employed in gathering this gum look more like corpses than living beings, owing to the constant attacks of fever they are subject to in these unhealthful places. There are no permanent inhabitants. Wild boars are numerous and hyenas not uncommon. Plenty of wood may be had by cutting, but it is chiefly pine and not lasting as firewood.

Shoals.—A rock, with 2½ fathoms water on it, lies 200 yards southward of Pelid Islet, and another shoal extends northward from Dairi Islet, but both these shoals are out of the usual track.

Directions.—In proceeding into Port Deremen keep in mid-channel and anchor where convenient; the small promontory on the eastern side of the port should be given a berth of nearly 200 yards, so as to avoid the spit running off it.

Seyut Bay (*Chanak Liman*).—This bay, northeastward of Port Deremen, is roughly semicircular, 1¾ miles wide, and possesses in the southern part an inlet fit for small vessels, with good holding ground. A stream discharges into the inlet, and a Roman paved road runs through the woody morass at its head, which shows it to have been a port of some traffic in former days; at present there are no permanent inhabitants. The islet of Yelu (*Karjah*), ½ mile in length, lies on the eastern side of the bay and shelters the inlet from northeasterly gales. A small inlet, Kesr Cove, lies between Port Deremen and Seyut Bay.

Shehir Oghlan Islands (*Senu Nisi*).—At 1 mile northward of Yelu Islet is a tongue of land terminating in Balu Point, which is foul nearly 150 yards off; beyond the point are the three Shehir Oghlan Islands. These islands form a snug little anchorage, and from the complete way in which they, with the coast adjacent, have been fortified it would appear to have been formerly a place of some consequence; at present there are no inhabitants. Between the islands, and nearly equidistant or about 200 yards from each, there is good anchorage for small vessels in about 7 fathoms, mud bottom.

Digitized by Google

Tomb Island, the smallest of the three, so called from having a single small white marble sarcophagus on it, shelters the anchorage from northeasterly winds.

Snake Island, the northern and next in size, abounds in those reptiles, and has evident marks of a line of fortifications running around it and many remains of square buildings.

Castle Island, the largest of the three, is nearly ½ mile in length east and west, and from the western end a tongue of land projects northeastward, forming a snug little bight on that side of the island. Towers and walls on this island, beautifully built, were a few years ago to be distinguished, though, being overgrown with shrubs and trees, some trouble was requisite. On the eastern and highest end there appears to have been a sort of citadel, in the Hellenic style, but around the other parts of the island the architecture is chiefly Cyclopean. The towers standing at intervals around the eastern end were all in good preservation.

The main coast eastward of the islands was also covered by similar walls and towers and many broken sarcophagi, all of which had been violated. The whole point on the mainland opposite the islands is thickly covered with shrubs, which render it difficult to make much research among the ruins; enough, however, was seen to show that it must have been a place of some importance.

Water.—There is a small spring on Castle Island, from which water was obtained sufficient for a crew of 80 men.

Dangers.—A rocky shoal, partly awash, called Duck Rock, extends about ¼ mile westward from Castle Island; a shoal also extends 100 yards off the southeastern point of the island, with 2¼ fathoms water on it.

At 550 yards 2° from the northeastern extremity of Snake Island, with the eastern point of Castle Island a little open eastward of Snake Island, is another rocky shoal about 100 yards in length, with 2½ fathoms on it. The passage between this latter shoal and Snake Island is clear, and at 200 yards from the island the depths are from 7 to 17 fathoms.

Directions.—Vessels from the northeastward, when about ¾ mile from the islands, should keep Tomb Island open its breadth westward of the point of the coast opposite, and proceed in, nearly on this line, passing midway between the Point of Tomb Island. When the southern side of Snake Island is open southward of the southern end of Tomb Island, steer toward the low hummock on the northern end of Castle Island until past Tomb Island, then edge to the southward and anchor.

In entering by the southern channel keep near the point of the coast, so as to avoid the shoal extending from the eastern point of

Digitized by Google

Castle Island, and steer northward with the mainland coast aboard until nearly up to Tomb Island, when proceed as before directed.

Vessels of moderate draft may also enter between Snake and Castle Islands by keeping in mid-channel, the shoalest water being 3¼ fathoms, sand. The water is clear and the bottom so distinct that the depth appears much less than it really is. Castle Island forms with Balu Point southward of it a bay about ¾ mile deep, with a petrified beach at its head. A little valley runs inland from the head of the bay; it is uncultivated, but rich in natural vegetable productions; wild clover and myrtles of great height are plentiful, as well as many other flowering shrubs. There is anchorage in the bay under favorable circumstances, and the bottom is mud, though the water is rather deep, but it is exposed during westerly winds to the whole fetch of the sea in the gulf.

Port Gallipoli.—This port, which still bears its ancient name, is about ¾ mile eastward of the Shehir Oghlan Islands and affords good and secure anchorage. On the northern side of the entrance is the islet of Bekchi, ¼ mile in length, and from it a rocky shoal extends 600 yards westward, having on it from 3 to 4 fathoms water, but near its extremity only 1¾ fathoms. No clearing marks can be given owing to the nature of the coast, but the distance from the extremity of the shoal to the southern shore of the entrance is nearly ½ mile, and the southern side should be kept aboard. The center of Snake Island in range with the point westward of the port leads on to the shoal.

The port is upward of 1 mile deep, having from 23 to 7 fathoms water. Two streams run into the sea at its head through low alluvial soil, and near the mouths of the streams oysters are plentiful; the water, as usual, is not fresh until some distance up. On either side of the low ground is a conical hill, on each of which are the remains of ancient forts. A small farm lies up the valley, where milk and cheese can at times be procured.

It is advisable never to sleep ashore in summer or autumn, as the malaria is dangerous.

The plain at night abounds with wild boars and hyenas, whose cries, mingled with the barking of dogs and whining of jackals, render the concert anything but pleasing. There are very few, and those only occasional inhabitants.

Anchorage.—The best anchorage is in 12 fathoms, mud, about 600 yards from the shore at the head of the bay.

Danger.—In entering Port Gallipoli from the eastward care should be taken to avoid a reef which lies 700 yards 37° offshore and bears 1,100 yards from the northeastern extremity of Bekchi Islet. The reef, about 400 yards in length east and west, has only 4 feet water on

Digitized by Google

it and 3 and 4 fathoms round it. It can be seen by keeping a good lookout.

Giova Bay and Port.—Between Port Gallipoli and the base of the high mountains on the north Giova Bay resembles a broad canal, being only 2½ miles wide, decreasing to 1½ miles at the port or anchorage of Giova, 5 miles eastward. With the exception of the reef just mentioned and the shoal ground bordering the low shore at the head of the bay, there are no dangers. As the water shoals gradually, a vessel may anchor in any convenient depth by the lead; the holding ground at Port Giova is most tenacious.

Miasma.—The Kadin River rises a short distance within the head of the bay and inside the bar is 3 fathoms deep. It receives several strong salt springs in its passage to the sea, and these mixing with the fresh water cause such a rank and unwholesome vegetation round the small swampy island in the entrance that the miasma arising from it proves fatal to the inhabitants of the small village in its neighborhood, who are obliged in consequence to abandon their habitations for a certain time every year.

Ancient buildings.—Several remains of ancient buildings indicate this part of the Gulf of Kos to have been the site of a town (perhaps ancient *Bargassa*), and some fortifications and a paved road leading to Marmarice and crossing the River Giova by an ancient bridge leads to the supposition that it was a town of some consequence. The idea is strengthened by several tombs having been found cut in the cliff about 2 miles eastward of Port Giova; they are somewhat in the style of those at Petra, and evince considerable skill as well as opulence on the part of the proprietors. The tombs are of the mixed Egyptian and Greek orders, the doors and entrances having the inclined sides; the largest is completely isolated, cut out of the living rock, and so perfect as to be easily delineated. Some way below the present bridge (an ancient one) is another, overthrown as by an earthquake; it appears to have been an ancient and admirably constructed work.

Fauna.—In the mountains and ravines on both sides of this part of the gulf wild beasts are still plentiful. Leopards, lynxes, hyenas, brown bears, wolves, jackals, and wild boars are occasionally encountered. The leopard is harmless if unmolested, but if fired at, although not struck, attacks, and is a most formidable opponent, conquered only by death. The leopards and hyenas attack the cattle and sometimes do much mischief. Deer are said to be plentiful.

Produce.—The plain of Giova is only partially cultivated. The principal exports from this port and the surrounding coasts consist of valonia, corn, timber from the neighboring forests, gum storax, and quantities of leeches. The leeches are caught in the marshes round

Digitized by Google

the head of the bay and packed in mud in small half casks with a piece of perforated tin on the top as breathing holes; they are sent principally to Italian ports, and form a source of profit to the miserable inhabitants of this part of the coast, who look candaverous, and are apparently not long-lived. Honey is also collected, and the quantity of wild heath and myrtle which grows all over the hills on the south side of the bay, and on which the bees principally feed, imparts a delicious flavor to the honey not often met with elsewhere.

Supplies.—There is nothing to be procured except a few fowls. Fish in great quantities may be caught with the seine, more particularly off the mouth of the Kadin River. In this river, which is a mixture of salt and fresh water, are vast numbers of large gray mullet, but they are said by the neighboring peasants to be highly poisonous and they never eat them.

Ancient forts.—Almost all the eminences surrounding the gulf have marks of fortifications of ancient date. Altin Sevresi, southeastward of Seyut Bay, 1,500 feet high and nearly inaccessible, has the ruins of a very strong fort on it.

Elevated plains.—On the elevated plains which lie among the mountains in this direction are occasionally numerous flocks and herds and droves of camels, driven here during the dry season when herbage fails in the lower country.

Aspect.—From Port Giova westward to Keramos the land on the northern side of the bay is of a highly interesting character, rising precipitously from the water's edge upward of 3,300 feet, clothed with the brightest verdure and crowned with forests of oaks, pines, elms, etc. Mingled with towering rocks and intersected with deep ravines (the haunt of numerous wild beasts), it has an appearance of primeval grandeur not often met with, and forms a strong contrast to the land on the opposite side of the bay, where the hills are of a tamer nature, softer aspect, and of a much more moderate elevation.

Akbuk Bay.—Mount Keranda or Keram Dagh, on the meridian of 28° 10′ E., is 3,160 feet high, and a little westward of this meridian is the promontory of Akbuk, projecting nearly 1½ miles southeastward, terminating in the cape, with the bay of the same name on its northeastern side. The southwestern part of the head of the bay is shoal and rocky, but on the northern side anchorage may be had in 14 fathoms water, sand, and weed. On the western side of the promontory is another bay, but smaller, known as Taham Altee, with a beach at its head and open to the southward.

Keramos Bay is 6½ miles westward of Cape Akbuk; the coast between is nearly straight, and is the base of elevated land rising from the sea 1,870 feet high, with deep water all along it. Vessels in Keramos Bay should anchor near the shore, as the water is deep, there being 17 fathoms, stiff mud, at 700 yards off. The southern

Digitized by Google

extremity of Cape Akbuk should be in range or just open of the bluff with a little rocky islet off it, eastward of the bay. It is exposed to southerly winds, but there is no great fetch for the sea.

Supplies.—Neither wood nor water can be procured, but fish may be caught with the seine.

Oren Point, on the western side of the bay, is steep-to; but Keramos Point, westward of it, should be given a berth of ½ mile, as the water round it shoals suddenly.

Vessels may also anchor, if necessary, in the bight westward of the latter point, but it is not so well protected as Keramos Bay.

Keramos Point forms the southwestern extremity of a small plain about 1½ miles square, on which are the ruins of the ancient city of *Keramos*, which, though not of great extent, contained some highly ornamental buildings and temples which now lie overthrown, apparently by an earthquake. There is still enough left to show the former wealth and consequence of its inhabitants. The number of sarcophagi is very great, and they are arranged outside the principal gate on the east side of the city in two lines, forming a continuous avenue of considerable length; they are very massive in structure, and have all been opened.

Ancient buildings, etc.—Outside the city are some Corinthian capitals and fluted columns, with well-executed representations of amphoræ and wreaths of grapevines, which lead to the supposition that on this place a temple of Bacchus once stood. The columns are in excellent preservation, but overgrown with shrubs and trees.

The walls of the city, which are plainly to be traced and in some places perfect, are principally Cyclopean mixed with Hellenic masonry and defended by square towers built in them at unequal intervals. They are carried up the foot of a range of hills joining the north side of the city, on which side, crowning one of these hills, is a square fort surrounded with triple walls, probably the citadel. Many remains of massive and large buildings exist both within and outside the city walls, but the most interesting and perfect is a gateway of white marble standing in solitary grandeur outside the walls in a cornfield. It is in excellent preservation, most elaborately sculptured, and looks nearly as fresh as if it were but recently erected. It combines the Egyptian style with the Greek, as the sides fall inward from the base, but the ornamental parts are Greek in character and design. The same mixed style of architecture is met with in the gulf farther eastward.

Without the city to the eastward is the base of a very large building, of considerable elevation, and built of immense squared stones. The superstructure no longer exists to enable a judgment to be formed as to the nature of it.

Digitized by Google

Stream.—The plain is watered by a small stream which runs through the center in winter and falls into the sea at Oren Point. The stream is dry during summer, except some stagnant pools, which, in July and August, cause the vicinity to be very unhealthful.

Coast.—Between Keramos Point and Cape Vasilika, 7 miles westward, the coast forms low shingle points with cultivated plains between them, the hills in the rear being well wooded and backed by high mountainous land. A small village stands about 3 miles westward of Keramos Point; farther on, two large tanks, one at 2 miles and the other at 3½ miles from Cape Vasilika, are conspicuous objects, and with their domes and whitewashed walls contrast pleasingly with the dark foliage of the hills.

Vasilika Bay, on the western side of the cape, is nearly ¾ mile deep, and in its northwestern corner is a well sheltered anchorage for small vessels in 13 fathoms water, but there is nothing to be obtained here.

A small shoal extends off from the western side of Cape Vasilika and another shoal from the point next westward of the entrance to the bay.

Alakishli Bay.—Westward of Vasilika Bay are several indentations and projecting points surrounded by rocks. Alakishli Bay, nearly 7 miles from Vasilika, has anchorage for small vessels during offshore winds off the middle of the sandy beach. Here are the ruins of an ancient fortress. Hermo Islet lies off the southern point, with a shoal between it and the point. All along this part of the coast there are great quantities of ironstone.

Orak Island.—Westward 3 miles from Alakishli Bay, is the island of Orak, 1 mile in length, and between it and an irregular arm of land projecting eastward are two little islets with shoal water around them; the whole together cover a bay or inlet, named Kishle Buku. At the head of the inlet on the west the depth is from 10 to 20 fathoms, but the holding ground is very indifferent.

Water.—The water here should not be used, as some obtained from a well made a whole ship's company ill.

Kara Ada or Karada.—This narrow island is 3¾ miles in length in a northwest and southeast direction and its eastern end is 5 miles from Orak Island. A little islet or rock lies close off its southern point where there is a small inlet, and the northern coast is bordered a little off by shoal water. The island has evidence of ancient fortifications on its summit. In its northern part toward the center is a remarkable cave, out of which flows a volume of hot water, which, gradually cooling as it approaches the sea, affords a snug retreat to the seals which are always found located there.

Kara Ada lies parallel with the coast, with its northwestern end southward of Budrum; the narrowest part of the channel which

Digitized by Google

separates it from the main is about ½ mile wide and 12 fathoms deep, but either side is bordered a short distance off by shoal water. Vessels under steam may take this channel on their way to and from Budrum, but a sailing vessel should be prepared for baffling winds.

Budrum Bay.—Taking Khatar Point as the western entrance point, Budrum Bay is 1¼ miles in length and about 1¼ miles wide at the entrance.

Khatar Point is surrounded by reefs, and a detached patch lies off it, about 1 foot above water, on which stands a stone column 13 feet high.

Sighi Shoals.—To the southward of Khatar Point are two other small detached patches, named Sighi Shoals, the northern patch being separated from the patch above water by a distance of 700 yards, with 22 fathoms water midway. The Sighi Shoals are 300 yards apart, the northern shoal having 2¾ fathoms on it, the southern 2½ fathoms, and between the two there are 20 fathoms water. The outer Sighi Shoal bears 179° 1,400 yards from Khatar Point, and vessels should not pass northward of it.

The little islet of Utchian, bearing 238°, open southward of Guirejik Island, leads southward of Sighi Shoals; Kaplan Point, on the western side at the head of Budrum Bay, 9°, open of Deguir Point, leads eastward of the shoals. Mount Elias of Kos Island, kept more than twice its breadth open of Guirejik Island, also leads southward of Sighi Shoals.

The shores of Budrum Bay are bordered by a narrow bank, and about 700 yards southward of Meshrik Point, on the eastern side, is a small rocky point to which it is necessary to give a berth of 400 yards.

Rocky patch.—Kalessi Point separates the bay of that name on the east from Budrum Harbor on the west, and on the point is situated the castle of St. Peter; 334 yards 142° from the southeast angle of the castle is the southwest end of a rocky patch with a least depth of 2½ fathoms over it.

The castle of St. Peter is whitewashed, and St. Georgio Point is walled around, with the base of the wall in the water.

Anchorage.—The anchorage is in from 11 to 14 fathoms, mud and weeds, with the southeastern angle of the castle bearing about 30°, Kaplan Kalessi tower 308°, and Deguir Point 235°, or a little farther off if necessary, protected in a measure from southerly gales by Kara Ada. Kaplan Kalessi Tower over Kaplan Point is all that remains of the ancient fortress of Salmacis.

Budrum Harbor is a circular basin about 700 yards in diameter, with the ruins of ancient moles on either side of the entrance. The deepest water is about the center, and the bottom consists of weed, but the best anchorage is rather westward, being more out of the

Digitized by Google

way; it is very shallow all around near the shore, fast filling in, and fit only for small vessels. It is surrounded by a complete amphitheater of hills and encircled by the remains of the ancient walls of *Halicarnassus*, on the site of which city the modern town of Budrum is erected.

Lights.—On the small islet on the western side of the entrance to Budrum Harbor two fixed white lights placed vertically are exhibited from a pole; the upper light is elevated 52 feet above the sea, and should be visible 10 miles. (See Light List.)

Ancient remains.—The ancient walls are plainly visible and in some places in good preservation. Within its circumference are the ancient theater and some columns of a temple to Bacchus, with the base of a large building which might have been that of a mausoleum. Many fragments of basso-relievo are among the ruins, but the most interesting of ancient remains, those of the famous tomb of Mausolus, were embedded in the walls of the castle, the sculptures from which are now in the British Museum. The small plain surrounding the town is covered with ancient remains, but difficult to find, as the ground is cultivated with figs, grapes, corn, etc.

Castle of St. Peter.—The castle was built by the Knights of St. John and has many traces of the knights in escutcheons in the walls of the battlements. Its whitewashed walls, with the surrounding houses, groves, and gardens, form a pleasing aspect from a distance.

Supplies.—Provisions are obtainable, but water is scarce and indifferent.

Communication. — Steamers running between Smyrna and Mersina, Karamania, call weekly.

Gumbet Bay.—There is anchorage in Gumbet Bay, westward of Budrum Bay, in 14 or 15 fathoms, but it is open to the southward, the shore all around is bordered by shoal water, and there is nothing to attract a vessel there.

Petasa and Biteh Bays.—These two bays are separated from Gumbet Bay by a tongue of land projecting 1¾ miles southward. Close to its southeastern part is the island of Guirejik, nearly ¾ mile in length north and south, with an islet between its northern end and the coast. There is a passage for small craft between the islands and the main, but none between the islands themselves.

The tongue of land forms with the coast westward of it a deep bight, nearly in the center of which is the islet of Parthena, about 700 yards in length, and between the islet and northern shore is a mud bank with 4½ fathoms water on it. Petasa Bay, in the northeastern corner of the bight, is frequented by small vessels, and is secure in any wind. Biteh Bay, in the western part of the bight, affords anchorage in from 15 to 17 fathoms, good holding ground, with the extremity of Biteh Point bearing about 184°, and the north-

Digitized by Google

ern extremity of Parthena Islet bearing 89°. The shore all around the bight is bordered by shoal water.

Water.—In the little cove on the western side of Biteh Point is a small run of water. The adjacent country is fertile and well inhabited.

Aspat Rock.—At 2¼ miles 203° from Biteh Point and a little more than ¾ mile from the coast of Cape Petera is Aspat Rock, above water, with 20 fathoms close to it.

Utchian Islet, less than 200 yards in diameter, with shoal water extending from its southern side, lies 700 yards southward of Cape Petera, and between there are 10 to 18 fathoms water.

Kos Channel, between the shoal extending from Kum Point (the northern extremity of Kos Island) on the south and Magpie Rock on the north, is contracted to 1½ miles in width. The coast of the mainland on the northern side of the channel is irregular, indented with bays, and bordered by shoal water.

Magpie Rock, with only 4 feet water on it, lies ½ mile 251° from Arkialla Point, with 7 fathoms between it and the shore. The marks for it are Pasha Rock in range with Chuka Islet (one of the Karabaghla Islands) bearing 300° and a white patch on the shore in range with Chifut Kalessi, a conspicuous hill with the ruins of an old castle on it, bearing about 51°.

The southern end of Kara Ada bearing 87°, open southward of Utchian Islet, leads southward of the rock, and Chuka Islet, well open southwestward of Pasha Rock, leads southwestward of it.

Pasha Rock, which is just awash, lies ¼ mile from Hussein Point, and is surrounded by a reef which extends nearly 400 yards north and south.

There is a narrow channel inside the reef, through which 3 fathoms water may be carried by keeping Karabaghla Point bearing 342° just open westward of Ereno Point.

Cape Petera bearing 90°, open southward of Arkialla Point, and the summit of Kato Island in range with the eastern end of Karabaghla Island bearing 334°, lead, respectively, southward and westward of Pasha Reef.

Light.—At 60 yards within Hussein Point is a white house with a mast on it, from which is exhibited, at an elevation of 82 feet above the sea, a fixed white light, visible 10 miles. This light and the red light on Kum Point, the northern extremity of Kos Island, mark the Kos Channel at night.

Karabaghla Island is the largest of a group consisting of about a dozen islets and rocks. Karabaghla is upward of 1 mile in length northeast and southwest, and consists of two peninsulas united by a low sandy isthmus. The northern peninsula is 500 feet and the southern 367 feet high. The island is skirted by small islets

Digitized by Google

and rocks on the west and south, and at 1.3 miles westward of it is the conical islet of Atsaki, less than 200 yards in diameter, with depths of from 25 to 40 fathoms between.

Lodo Islet, 600 yards southwestward of Lepto, at the southern end of Karabaghla, has a reef extending 300 yards southwestward, and should be given a wide berth. At about 1,300 yards southward of the southwestern end of Karabaghla is the little islet of Chuka, steep-to, and one of the marks for Magpie Rock. Eastward of Chuka is the larger islet of Malathro, with rocks above water at either end, and the two Kruso Islets northwestward, with shoal water around them.

The coast of the mainland eastward of the islands, is bordered by shoal water, which extends off in places more than 800 yards; the passage between the islets and main is called Karabaghla Channel and the passage between Chuka Islet and Kappari is called Chuka Channel.

Kato Islet, about 2.1 miles northward of Karabaghla, is 800 yards in extent, with an irregular rocky coast surrounded by shoal water.

Tower.—A circular tower is located on the northeastern point of Kato Islet.

Sponge Rock.—Equidistant from and a little eastward of a line joining the northeastern ends of Karabaghla Island and Kato Islet is Sponge Rock, with 6 fathoms water on it. Hussein Point Lighthouse in range with the northeastern extremity of Karabaghla, bearing 143°, leads westward of the rock; the Kruso Islets in range with the eastern extremity of Karabaghla Island, bearing 180°, lead eastward of the rock.

Pitta Islet.—Eastward of Sponge Rock and close to the coast is the little islet of Pitta, with 5 and 7 fathoms water between it and the shore.

Karabaghla Point, northwestward of this islet, has two large rocks above water off it, and southward of the rocks the coast is bordered by shoal water at the distance of ¼ mile.

Kardak Rocks, two in number, are small and about 300 yards apart, with 19 fathoms water between them; both rocks are foul about 200 yards off on their southeastern sides, and they lie 2¼ miles westward of Kato Islet, with deep water between.

Kappari Island.—This island (*Pserimos*) is 4 miles in length northwest and southeast, 2½ miles wide, and its northeastern part is 835 feet high, with an irregular coast line indented with bays. At ½ mile southward of Vasiliki Point (the northeastern point) is Sikua, a large rock above water with sunken rocks on its northwestern side; at 200 yards eastward of the line joining the rock and point is a 3-fathom shoal, which should be avoided.

Digitized by Google

Cape Russa, the southeastern extremity of the island, is the termination of a tongue of land projecting upward of 1 mile in the above direction; nearly 1 mile westward from Cape Russa is Teseremi Rock above water, 700 yards from the shore. Cape Sphuri may be considered the southwest extremity of Kappari Island, and at 700 yards northward of the cape is a reef with a rock above water, named Tathuro Nezgla, but close to the shore. At 700 yards farther is the entrance to Pseremo Cove, an inlet 700 yards deep, with beach and the village of Pseremo at its head.

Nikro.—On the western side of the island is the narrow island of Nikro, with an irregular coast line and skirted here and there with rocks; it is 1 mile in length north and south, with Nikrothikes Islet at its northern end, and 3 fathoms water between them. Nikro is connected to Kappari by a ridge with 4 and 5 fathoms water on it, and the passage is nearly ½ mile wide.

Kappari Channel is between Kappari Island and the shoal water bordering the northern coast of Kos Island.

Port Gumishlu (ancient *Myndus*).—On the mainland, about ¾ mile northward of Karabaghla Point, is a bluff 290 feet high, eastward of which is Port Gumishlu, a snug inlet extending 450 yards northward, having from 11 to 5 fathoms water, sand and mud bottom. On the eastern side of the entrance is an islet connected with the main by the remains of an ancient pier, and the deep water channel here is only about 40 yards wide; the shore around the port is a sandy beach.

Rock.—A rock with 15 feet water over it lies midway between the shores of the port, bearing 27°, distant 150 yards from the eastern entrance point. The breadth of the channel westward of this rock between the 5-fathom curve is 50 yards. The walls of Myndus extend over the heights northeastward at an elevation of 500 feet, forming a square of about 700 yards, within which are the remains of pedestals, a temple, theater, and other ruins.

Shoal.—Paleo Point is the name given to the northwestern extremity of the peninsula which shelters Port Gumishlu, and from it shoals extend 336° 650 yards, the least depth being 3 fathoms. This bank is steep-to on the western side.

Pondikusa and Keramidi Islets.—These two islets lie about 2 miles northward of Port Gumishlu. Pondikusa, the larger of the two, is nearly 1,400 yards in length north and south, surrounded by a narrow shoal, and is about 1,800 yards westward of Keramidi. The latter lies in an east-and-west direction, having some rocks at its southeastern end, where it is separated from the coast by a channel 200 yards wide and 5 fathoms deep.

Myndus Rock.—At about 1,400 yards 331° from the western end of Keramidi and 1,600 yards 50° from the northern end of Pondi-

Digitized by Google

kusa is Myndus Rock, with 4½ fathoms water on it, and lying right in the fairway of vessels passing between the two islets. Paleo Point in range with the western side of Malathro Islet, bearing 179°, leads on the rock; to pass westward of the rock the point should therefore be brought well open eastward of the islet. (For the Gulf of Mandelyah or coast northward of Myndus Rock, see p. 296).

Kalolimno Island is nearly 2 miles in length east and west, with an irregular coast forming on the southern side several little coves, and in the central part of the north side steep cliffs, on which side the island is steep-to. The western end is bordered by shoal water, which extends along the southern coast, where there is a sunken rock here and there close in. The little islet of Plero (*Mikro Nisi*), about 200 yards in diameter, with a sunken rock or two at its base, lies ¼ mile off the southern coast, with 22 fathoms water midway between.

The distance from the eastern end of Kalolimno to the Kardak Rocks eastward is a little under 2 miles and from the southwestern coast to Kalimno Island 3.3 miles. Both channels are clear and deep.

Light.—At 130 yards within the eastern end of Kalolimno is a white stone tower, from which is exhibited, at 181 feet above the sea, a flashing white light, visible 16 miles. (See Light List.)

Gargari Islet.—Northward 1 mile from the western end of Kalolimno is the islet of Gargari, about 400 yards in length northwest and southeast. The passage between is clear and deep.

Kalimno.—This island is irregularly formed, its main body to the southward being about 6 miles across, and from it a peninsula ridge extends northwestward. It is everywhere mountainous. The central ridge forms two peaks—Mount Parasiva, 2,250 feet high, and the other about ¼ mile southeastward of it, 2,200 feet high. The coast is rugged, with several inlets, bays, and coves. The island is not very fertile, though it produces figs, wine, barley, oil, and excellent honey; for the latter it was also celebrated in antiquity.

Population.—The population amounts to about 7,000, most of whom live at the skala or in the town of Kalimno, which stands at the foot of a steep cliff about 800 feet above the sea. Here are the ruins of the ancient town and fortress, at a little less than an hour's walk from the skala by a good road. The inhabitants are employed as sailors, in the sponge fishery, and in agriculture. The island is subject to Rhodes, and pays a small tribute.

Sponge fishery.—Kalimno is the headquarters of the sponge industry, about 200 vessels and nearly all the adult males being engaged in diving and fishing up sponges. They set out in May and return in September, visiting during that time the shores of the islands of Greece, the southern Sporades, and especially Rhodes, Crete, the whole extent of Syria, the island of Ruad, and finally

Digitized by Google

Tunis. Their vessels are so large and so well manned that they drive the Arabs and Sicilians completely out of the field. The best sponges are usually found at a depth of from 15 to 20 feet; those found in deeper water are of little commercial value. The largest and most delicate are found on the coast of the island of Stampalia and on one or two spots on the African littoral.

Port Kalimno, at the head of a bight at the southeastern end of the island and open to that quarter, is a semicircular bay about 800 yards wide, shallow, and protected on the south by a small mole, which is being extended, inside which the sponge boats take shelter; the depths are 9 or 10 feet, over mud and sand. The town of the skala is built around the shore of the bay, and the lazaretto is on the northern side. There is anchorage at the entrance of the port in from 20 to 12 fathoms water, muddy bottom, with patches of sand and weeds. The coast southward of the port is high, rugged, and steep-to.

Light.—A fixed red light, visible 3 miles, is erected on a float moored on the prolongation of the mole, about 44 yards from its extremity, southern side of the entrance to Kalimno Harbor.

Communication.—Kalimno can be reached by weekly steamer from Smyrna or by boat from Budrum.

Nera and Saphonidi Islets.—These two little islets lie off the southern coast of Kalimno. Nera, the larger, is 1 mile in length, with shoal water around its salient points; it lies ½ mile from the shore, and midway between there are from 35 to 50 fathoms water. Saphonidi is ½ mile in length, steep all around, and 1.3 miles south-southwestward of Nera, with deep water between.

Linaria Bay.—The south coast of Kalimno is irregular, high, rugged, and bold, with deep water all along it. Linaria Bay, on the west coast, is an indentation about 1,400 yards deep, and at its head is the little village of the same name. In the valley above are the principal of the ancient remains found in the island. The little islet of Khereia, steep-to on the west but foul and rocky on the north and eastern sides, lies ½ mile off the northern side of the bay. Between the reef on the islet side and the shoal rocky ground bordering the northern side of the bay and coast beyond it northward the water is 32 fathoms deep.

Telendos Island, on the west coast, is nearly 2½ miles in length, high, cliffy, skirted by shoal patches and scattered rocks here and there, with Apano Islet close southward of its western end. The island is separated from Kalimno by a passage ¼ mile wide, called Telendo Channel; midway between the shoal ground on either side it is clear and deep.

Argano Bay.—From the central part of the main body of Kalimno an elevated peninsula projects upward of 6 miles northwestward, and in the bight on the southwestern side is Argano Bay, upward of 1 mile deep, with from 15 to 10 fathoms water, mud bottom, at its

Digitized by Google

head. The entrance of the bay is sheltered from the southwest by Telendos Island, and in front of it northwestward is Kalavros Islet, ½ mile in length and 320 feet high.

Shoal.—In the fairway to the bay and 89°, 1,200 yards from the southern extremity of Kalavros Islet is a rocky patch with 4½ fathoms water on it.

Kephala, a circular projection about 1,400 yards in diameter and connected by an isthmus to the central part of the southwest coast of the peninsula, forms a little bay on its southeastern side, where there are a few scattered houses, called Emporio. The shore between Kephala and the head of Argano Bay is bordered by rocks, and from Toikhoi, a point ½ mile northeastward of Kalavros Islet, they extend off nearly 400 yards.

The mountains on either side of Argano Bay rise almost perpendicularly from the water's edge to a height of nearly 2,000 feet, forming a deep ravine, through which in the rainy season a torrent discharges into the head of the bay. The British naval vessel *Antelope,* in December, 1869, sought shelter here from an approaching southeasterly gale, which increased with much violence, but continued only for a few hours, when it suddenly became calm. The night was pitch dark, the rain came down in torrents, with flashes of the most vivid lightning in quick succession, and the highland surrounding the bay added to the darkness. The calm was shortly followed by a supposed gale from the northward, with heavy squalls from north-northwest to northeast, causing the vessel to be very uneasy and to roll heavily. At daylight, and after a most anxious night, it was determined to put to sea in preference to remaining longer. The anchors were accordingly hove up and the vessel steamed out of what was described as one of the most dangerous little traps that a vessel could be ensnared into. Although in the bay the squalls were off the land from the northward, at sea it was blowing a strong southwesterly gale.

Eastern coast.—The northeast and eastern coast of Kalimno is bold, rugged, irregular, and cut up into several bays and inlets, which are of no utility, and except at some of the salient points the water is everywhere deep.

Port Vathi.—Port Vathi is the central of three inlets on the eastern coast; it extends in between cliffs about ¾ mile to a small circular beach, where there are a few houses, called Vathis. Within the head of the port is a plain, cultivated with olive trees, which extends across the island to the base of the high cliffy ridge on the west and bounded on either side by the mountain ranges.

Skirometo Point.—The southeastern extremity of Kalimno, named Skirometo Point, is 1½ miles southward of Port Vathi and

Digitized by Google

is the termination of a piece of zigzag land forming Port Katzuni, and united about ¾ mile within to the main body of the island by a neck about 200 yards across. At about 300 yards off the northern side of Skirometo Point is Sari Nisi, 300 yards in diameter, with 24 fathoms water between. The coast thence to Port Kalimno, 3½ miles westward, is of the same rugged character as before, and steep-to.

Kalimno Channel.—The passage between Skirometo Point and Nikro Island, eastward of it, is 1½ miles wide, clear and deep, and called Kalimno Channel.

Levitha Islands.—At 28½ miles westward of Kalimno and nearly 6 miles northeastward of Liadi Islets, at the eastern end of Amorgos (described on p. 231), is the rugged island of Kinaros, which with the rest of the Levitha group belong to Turkey. Kinaros Island is 2 miles in length east and west, 1,050 feet high, irregular in shape, and with the exception of some sunken rocks close to its western extremity the water is deep all round its cliffy coast. On the southern side of the island is a narrow inlet nearly 700 yards deep, with 4 fathoms water at its head, called Pnigo Creek.

Laros Island, about 1,200 yards in length, has its northern and eastern sides surrounded close-to by shoal water. It lies less than ½ mile eastward of Kinaros, the water between the two being from 45 to 73 fathoms deep.

Mavro Islets.—At 4½ miles eastward of Laros Island is the western end of Levitha Island, and nearly midway between are the two Mavro Islets. These narrow islets, the ridge of a submarine mountain, are nearly united, being separated only by a very narrow cut 5 fathoms deep; they form a bend with the convex side to the northward, and together extend over a space of 1¼ miles east and west, with depths of from 3 to 11 fathoms water along the northern sides, but on the south and between the extremities of the islets there are 74 fathoms.

Levitha Island is rather more than 4 miles in length, east and west, very irregular in shape, with several bays or inlets, and toward the western end 550 feet high. The island is uninhabited.

Vathi Bay, at the western end of the island and open to that quarter, is narrow and more than 1 mile deep, with irregular soundings, varying from 40 to 5 fathoms at its head. Elmino Point, southward of the entrance of the bay and the southwestern extremity of Levitha, has shoal rocky ground extending off from it about 300 yards.

Levitha Harbor, on the southern side, is an irregular inlet nearly ½ mile deep, with from 15 to 2 fathoms water, and sheltered all around.

Nephri Point, the northern extremity of the island, is the termination of an irregular tongue of land extending ¾ mile northward, and is surrounded by rocks. On the western side of the point, is a little islet separated by a narrow channel with ¾ fathoms water; rocks

Digitized by Google

covered and uncoverd, extend 400 yards westward of the islet. The water elsewhere is deep, and there are no off-lying dangers.

Lights.—From a lighthouse on Spano Point, the eastern extremity of Levitha Island, two fixed white lights are exhibited, placed vertically, the upper light being elevated 131 feet above the sea, and visible 17 miles. (See Light List.)

Lero, the ancient *Leros*, is another irregular formed island, its coast being indented with deep bays and inlets. It is 7¾ miles in length in a northwest and southeast direction and from 1,400 yards to about 3½ miles in breadth. It is of no great elevation, the highest hill, Mount Kleithi, in the northeast part of the island, being only 1,060 feet above the sea. The only town, Sta. Marina, on the declivity of a hill on the eastern side, is crowned by a ruined castle of the Middle Ages. The inhabitants of the island numbering about 3,000, pay tribute to the Pasha of Rhodes, and, like their neighbors of Kalimno, find employment as sailors, sponge fishers, and agriculturists. The island is not very fertile, but produces fruit, honey, etc.

Communication is maintained by the Pantaleon Co.'s steamers, which call once a fortnight.

Lero Strait separates the islands of Kalimno and Lero. At the northern end of Kalimno Island are the two islets of Glaro and Nisia, which, united by rocks, together extend north and south nearly ¾ mile. Nisia, the southern islet, is separated from Kalimno by a narrow passage about 5 fathoms deep. The little islet of Velona or Glaro Nisi, which should be given a fair berth, lies about 200 yards from Theapori Point, the southeastern end of Lero, with 20 fathoms water between the two. Lero Strait, between Velona Islet and Blaro Islet south-southwestward of it, is about 400 yards wide and in mid-channel 30 fathoms deep.

Panale Bay, on the southern side of the promontory on which the town of Sta. Marina stands, affords shelter for small coasters from northerly winds.

Alinda Bay, on the eastern side of Lero, affords anchorage in from 10 to 18 fathoms water, but is exposed to easterly winds. Small coasters find shelter inside some rocks on the northern side, and also at Port Sta. Marina, under the town, on the south.

The shore of the bay is skirted here and there by rocks, and in the middle of the entrance, but rather toward the northern shore, is a 3½-fathom rocky shoal.

Parthani Bay, at the northwestern end of Lero, is ¾ mile deep, narrow at its head, with anchoring depths all over it. It terminates in a basin in the northeast corner, called Agia Matrona, having 3 fathoms water. Near the southern part of the head of the bay are some ancient ruins. The island of Arkhangelos, which is irregularly formed, but 1¾ miles in length, lies parallel to the northwestern

Digitized by Google

end of Lero and completely covers Parthani Bay. The passage between is called Pharios Channel, the name of some little islets at the southwestern end of Arkhangelos, and carries from 10 to about 30 fathoms water. If induced to take this channel, keep midway and pass out northward between Plakusa and Tripiti Islets, so as to avoid the 2-fathom shoal lying about 300 yards off the northern point of Lero.

Thremona Bay and Port Laki are on the western side of Lero Island, and these inlets cut more than halfway into the island; Xero Kambo is at the southern end. For these and the rugged and irregular coast with the rocks and shoal patches bordering it elsewhere, with one or two islets off it, the chart must be the guide.

Lipso Channel.—The space between Arkhangelos and Lipso Islands, called Lipso Channel, is 3¾ miles wide and is interspersed by several islets, rocks, and shoals.

Saraki, the southwestern islet, is about 200 yards in diameter, and lies 3½ miles 289° from the northwestern point of Arkhangelos, with an isolated sunken rock lying 200 yards off its northeastern side.

Koreli Rock.—At 800 yards 204° from Saraki is Koreli Rock, above water, and 700 yards eastward of Koreli Rock is a 4½-fathom rocky shoal. There are from 20 to 30 fathoms near these dangers, and they should be given a wide berth.

The western extremity of the Khalavra Isles open eastward of Phrango Islet, bearing 18°, leads eastward of them.

Phrango Islet, northeastward of Saraki, is 900 yards in length and 252 feet high, with rocks above and below water, lying 400 yards off its southern end. The passage between these rocks and the rock off the northeastern side of Saraki is nearly 1.3 miles wide, with from 45 to 50 fathoms water in mid-channel.

Miseo Reef.—At 800 yards northwestward of the northern end of Phrango is Miseo Reef, about 300 yards in extent, and partly uncovered; midway between the reef and islet the water is deep.

The Khalavra Isles are a cluster of six small islets, and two or three large rocks with sunken dangers, extending over a distance of 1½ miles in a northwest and southeast direction. There are boat passages between the islets, and with the exception of the southwestern side of the largest and western isle shoal water extends off all round about 300 yards.

A patch with 7 fathoms water on it lies 333° 30′ distant 600 yards from the northwestern extremity of the western isle.

Between these islets on the northeast and Phrango Islet and Miseo Reef, on the southwest the passage is clear and deep; between the islets and the rocks skirting the shore of Lipso the passage is 800 yards wide and in mid-channel 21 fathoms deep.

Digitized by Google

The Kalapodi are two islets extending over a space of 800 yards east and west, and bordered by a narrow bank, with deep water near them; they lie in the fairway of the eastern part of Lipso Channel and may be passed on either side.

Lipso Island.—Lipso Island, from which the channel derives its name, is 4½ miles in length northwest and southeast and from less than 700 yards to about 2 miles in breadth, its northwestern part being 903 feet high. Its coast is indented with bays and numerous little coves and skirted by rocks and uneven bottom, more especially the southeastern part.

Port Sokoro, on the southwestern side, is a snug little harbor, with from 16 to 5 fathoms water, mud bottom, and partly covered from the southwestward by the Khalavra Isles.

Port Muskat, at the northwestern end of the island, is another inlet, but of no utility.

South Aspra Isles are two little islets on a 3-fathom bank, extending eastward 1,400 yards from the southeastern part of Lipso. A third islet lies close to them on the southward with 8 fathoms water between.

At 700 yards 142° from the southern islet is a rocky patch with 1½ fathoms water on it.

Directions.—In steering between South Aspra Isles and Kalapodi from the westward keep the northern end of Phrango Islet open southward of the rocks at the southern end of the Khalavra Isles bearing 263° until the northern islet of North Aspra Isles is open eastward of the southern islet of the same group bearing 350°.

North Aspra Isles, are another group of islets and rocks, covering a distance of about 1 mile north and south and separated from the eastern end of Lipso by a space of ½ mile from 8 to 10 fathoms deep, but the passage is contracted to about 300 yards wide by rocky shoal ground extending from either side and which surrounds the islets.

Danger.—At 1,400 yards, from the northeastern extremity of the northern of North Aspra Isles is a rocky shoal with 2¾ fathoms water on it. The western of South Aspra Isles bearing 215° open eastward of the southern of North Aspra Isles will lead eastward of the shoal; the southern end of Grilussa Island in range with or only a little open southward of Kupaki bearing 283° will lead northward of the shoal.

The Rephulia are a group of small islets and rocks, covering a space 1.1 miles northeast and southwest, with rocks and shallow water extending nearly 600 yards northeastward from the northern islet; the southwestern, the largest islet, is 217 feet high. These islets lie off the northern end of Lipso, the passage between being about 700 yards wide and midway from 20 to 35 fathoms deep.

Digitized by Google

Arki Island is 3½ miles in length northwest and southeast with an extreme breadth of about 1 mile and an irregular coast line. Off its southwestern side is the island of Grilussa, the largest of a group of four islets fronting three little inlets. At the southeastern end of Arki Island is another group of five or six islets, but neither Arki nor the islets are of any importance. The passage between this group and the shallow water extending northeastward from the Rephulia Islets is ¾ mile wide and in mid-channel clear and deep. Vessels in the vicinity of the Lipso or Arki groups should avoid the salient points, and the chart should be the guide.

Patmos (Patino), called the Italian mariners of the Levant "San Giovanni di Patino," occupies a space of nearly 7 miles north and south, and at the northern end, where it turns southeastward, it is about 4½ miles east and west, but the island is very irregular in shape and the coast so indented with bays and inlets that in places it narrows to between 200 and 400 yards. It is of no great elevation, the highest hill, St. Elias, being only 874 feet above the sea, and is throughout a mass of barren black rock, with generally a steep cliffy coast. The population, amounting to about 2,500, is exclusively Greek, who gain a subsistence by transporting merchandise from place to place in their boats and by periodical emigration to the Continent or to more fertile islands where labor is required. They pay an annual tribute to the Pasha of Rhodes.

Port Skala, on the eastern side of the island, is an inlet 1,400 yards deep and 400 yards wide, carrying from 20 to 3 fathoms water, mud bottom. It is exposed to a long fetch from the southeast, and the winds blow over the hills in violent gusts, often shifting so as to render the port inconvenient for large vessels. About halfway in on the southwestern side is the village of Skala, containing about 50 houses, and on a hill overlooking the port is the town of Patino, in the middle of which and in the highest part of it is the monastery of St. John the Divine, presenting the appearance of a fortress flanked with towers and conspicuous from seaward; the monastery was built in the twelfth century. About halfway between the port and town is a natural grotto, over which is a small church. The town is reached by a steep and rugged ascent, and is about half an hour's walk from Skala.

Communication.—The steamers of the Pantaleon Co. call every fortnight from Smyrna and other ports.

Islets.—In the bend of the coast northward of the port are three little bays. Panagia Islet lies at the entrance of the middle bay known as Agria Livadia, and two other islets, Georgio and Kudro, lie off the northern shore of this large indentation, which is bordered by rocky, uneven ground.

Digitized by Google

Khelia Islet, nearly ½ mile in length, 369 feet high, and surrounded by rocks which extend 300 yards from the northern and southern ends, lies 2½ miles east-southeast of Port Skala.

The Sklavaki Isles, a group of little islets and rocks covering a space of about 1,400 yards in a northeast and southwest direction, lie between Khelia Islet and the eastern promontory of Patmos terminating in Cape Yeranos; the isles are steep-to.

Dangers.—Khelia Rock, with ½ fathom water on it and steep-to, lies 1,100 yards 181° from Khelia Islet, with Mount Sklaves (760 feet high) in range with the western extremity of Sklavaki Islet, bearing 350°.

Cape Yeranos, the eastern extremity of Patmos, well open eastward of Khelia Islet, bearing 3°, leads eastward of the rock; the northern side of the hummock on Cape Yenupa, in range with the southern side of Trago Island, bearing 267°, leads southward of the rock.

Trago Reef lies nearly 800 yards eastward from Trago Island, is partly above water, nearly ¼ mile in extent north and south, and steep-to, with deep water between it and the islet. From its southern end the northern side of the hummock on Cape Yenupa and the southern end of Trago Island are nearly in range. The passage between the reef and Khelia Rock is more than 1 mile wide, and with the exception of the 6-fathom rocky patch lying about 1,400 yards 255° from the southern end of Khelia Islet is deep and clear.

Port Griko and Stavros.—Southward of Cape Trago the coast forms a bay, and in the center is the Island of Trago sheltering a space within it about 400 yards wide, called Port Griko. The little port is completely sheltered, and from 3 to 8 fathoms deep. The principal entrance is southward of Trago Island, the northern entrance between the shoals on either side being only a little more than 100 yards wide.

Port Stavros, at the southwestern end of Patmos, is an indentation of the coast on the northwestern side of Mount Prasson (789 feet high) and separated from Port Griko on the east by an isthmus which is little more than 300 yards across, uniting the mount to the main part of Patmos on the north. The shore of Port Stavros is bordered by shallow water and rocks, but neither of these ports are in any way utilized.

The western coast of Patmos is steep and irregular, with three or four bays and here and there detached rocks, but as there is nothing to induce a vessel to come here it should not be closely approached; the northern coast is ragged with projecting points, and should also be avoided.

Anedro Islet and Petro Karavi.—Anedro Islet lies 2½ miles northwest of Cape Zoluphi, the northwestern extremity of Patmos; it is 1,100 yards in length east and west, steep and cliffy on the southern

Digitized by Google

side, with one or two rocks at its base and with from 40 to 50 fathoms water at about 200 yards off.

The Petro Karavi are a cluster of rocks extending ¼ mile north and south, with deep water round them, and lying 2 miles westward of Anedro Islet.

Furni Rock, a small patch said to have only 5 fathoms water on it, lies between Anedro and Makra Nisi of the Furni Islands. It bears 2°, 2.6 miles from the northeastern extremity of the former and 176°, 1.9 miles distant from the south point of Makra Nisi. Its vicinity should be avoided. To avoid Furni Rock, Furni Boghaz, the passage between Themina and Diapori Islands, must be kept open.

Sandama Peninsula, on the mainland of Asia Minor, is 600 feet high, covers a space 2 miles north and south by upward of 1½ miles east and west, and is now joined to the mainland by a low isthmus a little more than 200 yards across. Its shores are irregular and rocky, and off its northern point are four or five detached rocks or islets. The bay of Sandama, on the southern side of the peninsula, nearly 2 miles deep, is open to the west, with rocky shores on either side, and a little islet with shoal water round it on the south, but having deep water all over the central part. On the southern side of the entrance to Sandama Bay is Myndus Rock, with 4½ fathoms water on it, which together with Pondikusa and Keramidi Islets are described on page 286.

Pasha Bay.—On the northern side of Sandama Peninsula is an inlet called Pasha Bay, 1,400 yards deep, narrow, with a rocky islet on the western side of entrance, and rocky ground bordering the eastern shore, with deep water between. The bottom within is stiff sand and grass. The inlet is exposed to northerly winds.

Wreck Rock.—At nearly 1,400 yards 325° from the northern point Sandama Pensinsula is the norther of the detached rocks or islets before mentioned; it is 21 feet high, with deep water on all sides except the east, where there is a shoal patch with 2½ fathoms on it, about 200 yards off. The islet is called Wreck Rock, from the circumstance of a large vessel, sink in 9 fathoms water, having been found there years ago with her bowspirt touching the base of the rock.

Shoal.—At 800 yards 108° from the rock and about the same distance 7° from the northern extremity of the peninsula is a shoal patch with 3 fathoms water on it.

Mandelyah Gulf.—From Sandama Peninsula the southern shore of Mandelyah Gulf trends generally eastward 15 miles to the head of Guvergenik Bay; it is rugged and irregular, indented by deep bays, with rocky shores, projecting points, and off-lying islets,

Digitized by Google

and backed by the highland of the promontory of Budrum, which in Oglu Dagh reaches the height of 2,280 feet above the sea.

St. Apostola Island, 5 miles to the eastward of Wreck Rock and 800 yards offshore, is 1 mile in length northwest and southeast and 386 feet high, with some ruins on it; its southern end is bordered by shoal water. An islet, also with shoal water around it, lies close to its northwestern end. Between the shoal at the southern end of St. Apostola and the point of the coast southwestward of it, which is steep and bold, the passage is about 700 yards wide and 25 fathoms deep in mid-channel. At the eastern entrance of the passage equidistant from the island and shore is a high, steep rock.

Ghiul Bay or Chesil Liman.—The entrance to this bay is 1¼ miles southeastward of St. Apostola Island. The bay extends southward upward of 1 mile to the valley at its head, where there are some ruins, and a little back from the shore is a lagoon which communicates with the sea. An island and a little southwestward of it a small islet form, with the steep peninsula bounding the western side of the bay, a narrow creek carrying from 15 to 20 fathoms water. There are anchoring depths all over Ghiul Bay, but southwestward of the island and on the same side is a bight where there is anchorage in from 10 to 15 fathoms, mud, sheltered from all winds except from northeastward to eastward. The southern point of the bight is bordered by shoal water. A stream runs into the head of Ghiul Bay.

Durvanda Bay.—At about 4½ miles southeastward of Ghiul Bay is the head of a deep bight called Durvanda Bay, with anchoring depths of from 5 to 18 fathoms; from here the distance across the promontory to Budrum on the south is a little over 3 miles as the crow flies. The salient points southeastward of Ghiul Bay are bordered by shoal water.

On the eastern side of Durvanda Bay, at 1½ miles from its head, are two little islets surrounded and connected to the shore by shoal water. The elevated land over the head of the bay is 1,776 feet high.

Shoal.—Denir Liman is the name given to a small indentation about halfway between Ghiul and Durvanda Bays, and off its entrance is a shoal about 300 yards in extent, with 2 fathoms on it and deep water around and inside it.

Tarandakia Islets.—The two islets of Tarandakia lie in the center of the deep bight before mentioned and are separated from each other by a passage 300 yards wide and from 5 to 7 fathoms deep; the southern islet is the higher, and 140 feet above the sea.

Tarandos (ancient *Karyanda*).—This island is 2½ miles in length east-northeast and west-southwest, irregular in shape, and 498

Digitized by Google

feet high. At its eastern end there is a village and some ancient ruins. Shoal water extends ¼ mile southward of its western end, which can be avoided, as the passage between it and the Tarandakia is nearly ¾ mile wide, with deep water.

Tarandos forms with the coast eastward of it a narrow channel about 300 yards wide, carrying 10 fathoms water. A small shoal extends from the island at the southern entrance and another shoal from the mainland coast at the northern entrance.

Guvergenik Bay is 1.6 miles deep, with an average breadth of about ½ mile, and having from 20 to 5 fathoms water. Southwestward of the bay are two little islets or rocks named Karandakia close to the coast, and the shore on the southern side of entrance is bordered by a narrow bank. On the southern point, called Karahdereh, are ruins, and at the head of the bay are others, with the village of Kiuvergini; this is the supposed ancient port of *Karyanda*. The bay is well sheltered, and fronted by Tarandos and Tarandakia Islands.

Kavo Asar.—At 1¾ miles northward of Tarandos Island is Kavo Asar, the tip of a tongue of land projecting 1 mile northwestward, and off it is Red Islet or Kargo Nisi, about 300 yards in length. There are 10 fathoms water between the islet and the termination of the tongue, but on either side the water is shoal, which narrows the passage, and it is only fit for small vessels. At 2.6 miles beyond Red Islet is the entrance to Bargylia Creek, and between is a small islet and one or two shoal patches bordering the coast.

Bargylia Creek runs 1,400 yards in a southeasterly direction and has from 9 to 3 fathoms water as far as a sandy spit, within which is a shallow lagoon with broken ground continuing 1 mile farther to the causeway of ancient Bargylia, when it turns and runs for 1 mile southwestward. The Aliki River discharges into the southeastern part of this arm. On the site of Bargylia may be traced vestiges of ancient walls, remains of an aqueduct, theater, temples, tombs, a fortress of the Middle Ages, and other ruins.

Iassus Bay, at the eastern part of the gulf, extends nearly 5 miles northeastward, with an average breadth of 2½ miles. Its shores are indented by several coves and surrounded by hills which on the south are upward of 1,000 feet high, and there are anchoring depths all over it.

At 1½ miles northeastward of Bargylia Creek is a little islet or rock, surrounded by shoal ground, lying close to the southwestern point of Chulukioi or Kiulukioi Cove; on the northeastern point of the cove is the village of the same name, and thence a road leads into the interior. Vessels anchor off the village.

Sheiro Bay.—On the northwestern side of Iassus Bay a tongue of land projects ¾ mile southeastward, westward of which is the little

Digitized by Google

Bay of Sheiro, with from 7 to 3 fathoms water; a sunken rock lies a little within, on the eastern side of the entrance. Makro Nisi, a narrow island, 1 mile in length and parallel to the northeastern side of the tongue of land, forms with it a narrow channel having from 7 to 11 fathoms water; farther in are two islets, named Chiro Nisi and Aspro Nisi, each with shoal water around it, the outer edge of which is steep-to. Elsewhere all the upper part of Iassus Bay has from 13 to 6 fathoms.

Isene (ancient *Iassus*), about ½ mile in length north and south, and formerly an island but now united to the low shore, has on its western side the little port of Isene, with from 3 to 4 fathoms over a space of 400 yards, and shoaler water within. The narrow entrance is 5 fathoms deep, between the remains of a mole on the west and an old tower on the east. On the summit of Isene is a Venetian castle, and in the vicinity are the remains of a theater, temple, aqueduct, and tombs, traces of the ancient walls, and other ruins.

Between Isene and a projecting point on the east is the bay of Isene, about ¾ mile deep, with a sandy shore at its head, bordered by shallow water, and in the outer part 5 to 6 fathoms deep, mud bottom; a stream runs into the bay. To the eastward of Isene Bay is another bay, named Kasalkioi, with the village of the same name and a customhouse. At about 1 mile to the southward of Kasalkioi the shore is broken and bordered by shallow water which extends off nearly ¼ mile. The Sari Chai runs into the sea, and also feeds an extensive lagoon.

Alaguni Bay.—To the northwestward of Isene Bay is Alaguni Bay, 2½ miles deep, with an irregular shore and shoal water extending from the salient points. Two shoal patches lie in the central part of the bay—one with 7 fathoms water on it, the other with 5 fathoms. The bay is formed by the termination of ridges on either side diverging from within. The ridge 1 mile from the northwestern point is 904 feet high and that about ¾ mile within the southeastern point 643 feet high.

Kasikli Bay, next northwestward of Alaguni, is 4 miles deep and 1 mile wide at 1¼ miles distance from its head. Here there is anchorage in 8 to 12 fathoms, mud bottom. The last mile of the bay runs in north, with a width of 400 to 600 yards, forming 1,400 yards from the head, a small sheltered anchorage in 6 fathoms; the head itself taking the shape of a little circular basin 3 to 9 feet deep, called Kasikli Harbor, having a small islet in it.

Mount Grius.—The bold elevated land on the northwestern side of Kasikli Bay, at a little more than 1 mile within, is 1,377 feet high; to the northeastward Mount Grius reaches 3,573 feet; beyond this again, at from 10 to 15 miles from the head of the bays, the lofty range of the ancient Latmus is 1,500 feet above the level of the sea.

Digitized by Google

Kapota Islet is about 800 yards in length, 184 feet high, and lies 2.4 miles 244° from Cape Spratt, the northwestern entrance point of Kasikli Bay. With the exception of a narrow bank at the northern end, the islet is clear of danger.

Kapota Shoal, with 4 fathoms water over it, lies ¾ mile 92° from the center of the islet, with a depth of 34 fathoms between.

Cape Nijekul, on the eastern side of the entrance to Alaguni Bay, bearing 112°, and well open of Cape Alanguli, the western entrance point, leads southward of the shoal and Kapota Islet. The point, 1 mile northward of Kavo Grœas on the eastern side of the entrance to Basilicus Bay, shut in with this cape, the latter bearing 342°, will lead eastward of the shoal. To pass westward of the shoal keep Kapota Islet close aboard.

Cape Spratt is the southwestern termination of the bold elevated land rising over the western side of Kasikli Bay, and from it a shoal extends off a distance of 400 yards. The shore from the cape thence round the eastern side of Basilicus Bay is irregular and bordered by shoal water.

Isabel Rock, with ½ fathom water on it and 7 and 8 fathoms around it, lies 1.4 miles 291° from Cape Spratt and a little more than ½ mile 199° from Kavo Grœas.

Mount Slata bearing eastward of 112°, and well open southward of Cape Spratt, will lead southward of the rock; Xiphorima Point, ¾ mile eastward of the cape, kept well open bearing 95° will also clear the rock.

Ikikat Rocks extend over a space of 700 yards with from 1 to 3 fathoms water on them and from 5 to 12 fathoms round them; they are 1,600 yards westward of Kavo Grœas, with from 10 to 17 fathoms between them and the shore, and 20 fathoms outside them. At about ¾ mile farther northward and nearly the same distance from the shore is another patch with 5½ fathoms. The above dangers are on the eastern side of the fairway into Basilicus Bay.

Basilicus Bay.—The shore of Kyriaki Point, the western entrance point of this bay, is irregular, being formed into several little points and bordered by shoal ground which extends 800 yards eastward, with a large rock or islet on it, known as Kyriaki. Between this shore and that northward of Kavo Grœas on the east the distance is nearly 2.3 miles; the bay then extends northeastward about 5 miles to lowland at its head. The shore all round the bay is bordered by rocks and shoal water, with shallow patches in the central part toward the head, where the bottom is generally uneven.

Panagia Islet.—Basilicus Bay is fronted by Panagia Islet, about 1,400 yards southward of Kyriaki Point and 1,100 yards in length, surrounded by a bank with shallow rocky ground extending ¼ mile northeastward.

Digitized by Google

Shoal.—At ¾ mile beyond the rocky ground and in the same direction is a shoal 600 yards in extent with 2½ fathoms water on it and 5 fathoms on the bank between. Within the entrance, on the western side of Basilicus Bay, is the bay of Kruvraike, upward of 1 mile deep, with from 6 to 9 fathoms water.

Anchorage.—In the upper part of Basilicus Bay, on the eastern shore, is the village of Akbuki, and off it is anchorage in 6 to 10 fathoms, mud, southwestward of the shallow patches previously alluded to.

Directions.—A lane of deep water leads into the bay between Panagia Islet and Kyriaki Point which may be used by small vessels. The summit of St. Apostola Island in range with the western side of Kapota Islet, bearing 177°, leads into Basilicus Bay eastward of Panagia Islet and between the dangers on either side. When well within the entrance a vessel may anchor in Kruvraike Bay or steer along the eastern side for the anchorage off the village of Akbuki, avoiding the shore bank and the shoals in the northern part of the bay, for which the chart must be the guide.

Bank.—A large rocky bank, with 7 fathoms on it, lies southwestward of Panagia Islet, with deeper water between. The outer part of the bank bears 238°, and is distant 1½ miles from the southern extremity of Panagia Islet.

Cape Monodendri (ancient *Posidium promontory*).—From the entrance of Basilicus Bay to Cape Monodendri the distance is about 7½ miles. The irregular coast between forms Skrophes Bay and a few little coves, and is bordered by shoal water which 2 miles west of Skrophes Bay extends 200 yards from the shore.

The Posidium is a rocky bank, 600 yards in length north and south, with 3 fathoms least water on it; its southern end is 1,600 yards from the shore and bears 159°, distant 1¼ miles from Cape Monodendri.

Approaching Cape Monodendri from the eastward, when near the Posidium Shoal, Kyriaki Point should be kept well open of Karako Point on the western side of Skrophes Bay, bearing 80° until Cape. Monodendri bears 7°, when this cape may be passed at a distance of 1,600 yards.

Pharmako.—This island (the ancient *Pharmakusa*) is 2 miles in length north and south, varies in breadth, with bays on its eastern side, and its southern part is 300 feet high. The water all round it is deep except at one or two places close in to the shore, and there are some ancient ruins on it. It lies 5¼ miles southwestward of Cape Monodendri, with about 40 fathoms water midway between, over a nearly level bottom.

Kovelo Bay (ancient *Panormus*), 3½ miles northward of Cape Monodendri, is about 1,400 yards deep and open to the westward. On its southern side are two or three semicircular little coves, and a few

Digitized by Google

years ago at the head of the bay were some fragments of columns. A road leads from the bay to Ieronda and the ruins of Didymi on a hill southeastward and thence to Skrophes Bay. The shore from Cape Mondendri to Dinakli, 6¼ miles northward, is irregular and bordered by a narrow bank with rocks; thence, the coast takes the form of an irregular, broken up, shallow bight to the mouth of Buyuk Mendere and Meander Point, which bears 350°, distant 7 miles from Cape Monodendri.

Gaidaro (ancient *Hyetussa*) is an island of irregular shape, 4.2 miles in length east and west, and toward the western end 720 feet high. The coast line is broken up into several bays or inlets. On the northern side of the island are four islets, and between Strongilo and Nero, the two central ones, is a large rock above water, from which a reef with less than 1 fathom water on it extends westward halfway to Strongilo; Nero Islet, 208 feet high, is 1.1 miles in length east and west, and its western end is united to Gaidaro by a reef.

Rock.—There is a rocky shoal with less than 1 fathom water on it lying nearly 700 yards east-northeastward from Claro, the eastern islet, which being a salient point should be given a sufficient berth to clear this shoal. At a short mile southward of Gaidaro and lying parallel to it is the islet of Kunelli, narrow, but 1,200 yards in length, with from 35 to 45 fathoms water between it and Gaidaro.

The bays formed by the irregular coast of Gaidaro are only convenient for small vessels in the inner corners and with suitable winds. With the exception of the dangers named, the water round the island is deep at a short distance.

The passage between Gaidaro and the mainland is deep and clear, and also between the island and Arki.

Coast.—Meander Point is a low sandy projection, through which the Buyuk Mendere runs into the sea. On its southern side, as before mentioned, the shore is broken and falls back to the northeastward a considerable distance, leaving a large shallow opening which in part is used as a fishery. About 3 miles northward of the point and 1½ miles inland is a hill 335 feet high, the ancient Lade Island. The shore northward as far as the base of the elevated range of the Samsun Dagh, a distance of 10 miles from the point, is low and broken, with lagoons open to the sea, used as fisheries, and swampy land within extending some distance into the interior. The coast is all along bordered by shoal water, and in places the depth of 5 fathoms is 1 mile from the low shore, although ½ mile off Meander Point itself there is 25 fathoms water.

Buyuk Mendere or Meddro Chai (ancient *Meander*), after a long and tortuous course from the eastward between mountain barriers, passes the ruins of Miletus at about 5 miles from the coast.

Digitized by Google

and running southeastward enters the sea at Meander Point; the depth of water some distance within the mouth is 2 to 5 fathoms. The Palaio Mendere or Meddro (ancient *Gæsus*) joins the Meander from the north-northeast a little below Miletus.

Caution.—The mouth of the Bayuk Mendere is said to have extended considerably to the southward since the date of the last survey; caution is therefore necessary when approaching the entrance.

Samsun Dagh (ancient mount *Mykale*).—This elevated range of mountains extends east and west upward of 15 miles, and rises suddenly from the low swampy land on the south to its lofty summits 3,459 feet to 4,130 feet above the sea, and falls again on the north, where its base forms the southern coast of the Gulf of Skala Nuova. Upon the rocky slopes toward the southeastern termination of the mountain are the ruins of Priene (now called Samsun), on a bold and precipitous rock; they consist of walls covering an extensive slope of the hill, out of which, as if built by art, spring perpendicularly the rocks on which the Acropolis was built. Priene is said to have been originally on the seashore. The elevated mass of the Samsun Dagh terminates westward in Cape Kanapitza (ancient *Trogilium Promontory*).

Cape Kanapitza.—At the termination of the low shore the coast (being the base of the Samsun Dagh) turns suddenly westward for about 6 miles to Cape Kanapitza, when it trends northward to the Strait of Samos. Close southward of Cape Kanapitza are three islets, each connected to the shore by shallow ground, two of which are inclosed in bays, and the third, named Theopori, forms the salient point of the coast, and is steep-to. (For Strait of Samos, see p. 344.)

Furni Islands.—These islands (ancient *Korassiæ*) are of a peculiar formation and broken into the most fantastic shapes. The whole group consists of 12 islands and rocks, and all except Furni are uninhabited. They have no good harbor, though there are many creeks where small vessels with local knowledge may lie. Furni, the largest island, occupies a space of 7½ miles north and south, but is irregular and narrow, and rises at its northern end to a height of 1,591 feet. The only productions are a small quantity of corn, rabbits, some miserable pigs, and honey. The inhabitants are few, and collected in a small village in a bay on the western side of the island, and near it are remains of ancient buildings.

The columns of the temple of Juno at Samos were hewn from quarries on the southwestern side of Furni Island, where a few years ago were to be seen parts of columns of the same dimensions and species of marble as those of that celebrated edifice.

Light.—It is proposed to erect a lighthouse on Cape Malaki, the northern extremity of Furni Island.

Digitized by Google

Vagli Cove, in the central part of the west coast of the main island, forms a secure anchorage for small vessels, but the water at the entrance is deep.

Marmoron Bay.—The most secure anchorage is in Marmoron Bay (Marmarokopio), situated eastward of the southern point of Diapori Island, where there is a mud bottom. The bay eastward of the northern part of Diaporo Island, where the village is situated, is insecure, being open to northerly gales and the bottom rocky.

Agios Menas Island.—On the eastern side of Furni is the island of Agios Menas, about 2 miles in length northeast and southwest. In the little bay opposite its western end there is temporary summer anchorage.

Themina, the western island, is about 3 miles in length, east and west, and 1,585 feet high. Between it and Diapori Island is a channel not quite 100 yards wide, clear, and 10 fathoms deep, called Furni Boghaz, and in cases of necessity, with a fair wind or steam power, a vessel may pass through it. There is no passage between Diapori and Furni. The western extremity of Themina is separated from the coast of Nikaria by a passage 4¾ miles wide, which is clear and deep, and takes the name of the latter island.

Alazo Nisi—Rock.—A rock with 2½ fathoms of water on it lies on the eastern edge of the 13-fathom bank 800 yards 241° from the western extremity of Alazo Nisi.

Furni Rock, said to have only 5 fathoms water on it, lies 1.9 miles 176° from the southern point of Makra Nisi, the most southern islet of the group. To avoid this danger keep within or without this distance, and as long as Furni Boghaz is open a vessel is westward of the rock. There are no other dangers by keeping a proper distance from the shore.

Furni Pass.—The Furni Islands are a dependency of Samos and are separated from the southwestern end of that island by a deep and clear channel 3½ miles wide, called Furni Pass, but it has been observed that sailing vessels making to the northward with contrary winds seldom pass through this channel, but prefer the Strait of Samos.

Current.—The current always sets through between Samos and Furni to the northward and causes a confused disagreeable sea.

For Samos Island and coast to the northward, see page 348 et ante.

Digitized by Google

CHAPTER VII.

THE GULFS OF SMYRNA AND SKALA NUOVA, WITH THE ISLANDS OF PSARA, KHIOS, SAMOS, AND NIKARIA.

For description of the Kaloyeri Rocks, lying on the same parallel and nearly equidistant between Cape Doro of Eubœa and the southern end of Khios, see page 138.

Psara Island, 27 miles northeastward of the Kaloyeri Rocks, is 4½ miles in length north and south and nearly 4 miles in breadth at its northern end, which is the widest part. It is lofty, and Mount Elias, the greatest elevation rising at the northern end, can be seen at a great distance. Situated on the inner part of Paleo Kastro, the southwestern point of the island, is Psara, an indifferent town, partly in ruins, and at its southern extremity is a peaked rocky elevation on which stands the fort or castle. The population of the island is about 3,500, all Greeks.

Port of Psara.—Under the eastern side of the town there is a small mole, with 2 to 2½ fathoms within, over muddy bottom, which affords shelter to a few small trading vessels.

Anchorages.—The anchorage in Choralolimani Bay, though exposed to the south, is considered secure during the summer months, as the holding ground is good, and it is an excellent place of shelter during strong winds from the northward. A fair berth is in 12 fathoms, with the two southern points of the island (eastward of the bay) in range bearing 94°. Farther out the bottom is rocky and uneven.

Vessels sometimes lie in a cove and secure to the shore inside a small rocky islet at the northern end of the bay on the western side of Psara Island.

There is also occasional anchorage southward of Anti Psara, off which end of it is another small rocky islet, but between the two there is no passage.

Paleo Kastro Point, on which the fort stands, is also surrounded by rocks, and should be given a berth of at least 300 yards; on the eastern side of the point is a shoal with ½ fathom water on it.

Kokino Pulo, the southeastern point of Psara Island, is also bordered with shallow water to a distance of ¼ mile.

Psara Island—Light.—On Kokino Pulo, about 220 yards from the extremity of the point, on a white circular tower, 39 feet in

Digitized by Google

height, is a flashing white light, at an elevation of 246 feet; visible 20 miles. (See Light List.)

Shoals.—Anti Psara lies 1¼ miles westward of the southern part of Psara Island, and in passing between them a vessel should keep close to the former to avoid the following shoals:

Rock west of Psara town.—Between Windmill Hill and the town of Psara, at ¼ mile from the coast, is a rocky shoal with ½ fathom water on it and 12 fathoms between it and the shore. This danger is in the way of vessels working to windward.

Kuchopata Shoal, with 4½ fathoms on it, lies midway between Psara and Anti Psara, bearing 1,600 yards 69° from Xerathia tu Cava, the northeastern extremity of Anti Psara. The latter has shoal water extending from it in the same direction 200 yards.

Rock.—A 2-fathom patch lies 1 mile 164° from Turusi Pulo, the northwestern extremity of Psara Island. Between this rock and the reefs from the Psara shore the distance is ¼ mile and depth 42 fathoms.

Mustapha, with less than 1 fathom water on it, is the name given to the outer of a group of rocks below and above water extending 600 yards northwestward from Turusi Pulo.

A rock having only 1 fathom water on it lies ½ mile 277° from Markaki, the central point on the north coast of Psara Island; from the rock this point and that of Tritispela, the northeastern extremity of the island, are nearly in line. To avoid this danger keep the latter point well open of the former until the little rocky islet of Agios Georgios bears southward of 236°.

Another rock, with less than 1 fathom water over it, lies 400 yards off the eastern point of Xera Chukanarlu Bay, bearing ¾ mile 237 from Markaki Point.

Current.—On the western side of Psara the current generally sets to the northward.

Caution.—As the current sets strongly on to the northern side of Psara Island, it is advisable, especially in a sailing vessel with light winds, to give this side of the island a fair berth.

Khios (Scio) Island.—This important island is 27 miles in length north and south and varies in breadth from 7 miles in the center to 15½ miles at the northern and 12 miles at the southern end. The population amounts to about 69,000. It is rocky and mountainous throughout nearly its whole extent; Mount Elias (ancient *Pelinæus*), its greatest elevation, at the northern end, being 4,157 feet high. Southward the mountains gradually decrease in height and terminate at the southern extremity in Cape Mastiko, a bold prominent headland, about ¾ mile northward of which a hill over the eastern coast is 960 feet high. The hills are for the most part composed of a red-

Digitized by Google

colored marble streaked with white, and round the city are quarries of reddish freestone.

Cape St. Nikolo, the northwestern point of the island, is 10 miles to the eastward of Psara Island, the channel between being deep and clear of danger.

Productions.—Khios Island is celebrated for its beauty and fertility, and the climate is healthful and most delightful. It produces olive oil, figs of a large size, grapes, oranges, citrons, lemons, almonds, and other fruits, which are exported both dried and fresh. Wine is made in large quantities and held in some repute, and Khaki (a spirituous liquor distilled from raisins) is the best in the archipelago. Much silk is also produced and manufactured into stockings, gloves, gowns, etc. The gum mastic, one of its chief sources of wealth, is the product of a species of lentisk (*Pistacia lentiscus*); the other productions are sweetmeats, candied citrons, preserved cherries, sirup of cherries, conserve of roses, rose and orange flower water, etc.

Khios Island possesses a great number of fine springs, and water is found everywhere by digging. The chief town or city is Scio, on the eastern side of the island.

Trade.—The exports consist principally of leather, mastic, oranges, lemons, and almonds; and the imports, principally manufactured goods and hides.

Cape Mastiko, the southern extremity of Khios, is a bold, abrupt headland, and at about 1.3 miles southward of it is the high, conical islet of Venetiko, with from 25 to 50 fathoms water all around and no danger between it and the cape; both show well at night.

The current off Cape Mastiko is strong and uncertain, and it generally sets to the northward along the western coast of the island.

Coast.—From Cape Mastiko the coast extends 9½ miles to the northwestward to Cape Amista, being bold and broken with several small bays, but no anchorage and no off-lying dangers. From Cape Amista it trends to the northeastward.

Rocks.—Brown Rock, dry, and connected with the shore, from which it is distant about 700 yards, is 1½ miles to the northward of Cape Amista; and Black Rock, also dry, and ¾ mile farther on, is 800 yards from the shore, with deep water between.

Ports Mesta and **Aluntha.**—Between Cape Amista and Cape St. Nikolo, about 18 miles to the northward, the coast forms a deep bight without anchorage excepting at Volisso. Port Mesta is on the southern shore of the bight. Both ports are fit only as places of refuge for small vessels, and are destitute of fresh water. Aluntha is a small islet about midway along the shore of the bight, at the head of which are some salt springs.

Aspro Isles, in the southeastern corner of the bight, afford shelter to vessels of about 20 tons. Their vicinity abounds with fish.

Digitized by Google

Volisso Road, in the northern portion of the bight, affords the only anchorage for any but very small vessels; vessels may anchor here during northerly winds when unable to get through the channel between Psara and Khios.

Anchorage.—The old castle of Kastro on the hill, bearing about 7°, and the left extremity of Khios Island 302°, will be a fair berth. A small islet lies inshore, united to the main by a reef, over which there is no passage.

The promontories on the western side of Khios Island bear a close resemblance to each other, and this side of the island is comparatively uninhabited, all the principal villages being on the eastern side. Volisso and Mesta are the chief places.

Cape St. Nikolo, the northwestern point of Khios, will be recognized by the round tower on its summit; it is bordered by shoal water, which extends along the coast northward and southward about 1,400 yards off.

Squalls.—In southeasterly gales the squalls off the Amanei Mountains, over the northwestern part of Khios, are severe, and sailing vessels bound through the Psara Channel should keep at a distance from the land.

Current.—The current along the western side of Khios generally sets to the northward.

Cape Anapomera, 9 miles eastward of Cape St. Nikolo, is the termination of Mount Elias, the greatest elevation of Khios, which at 2¾ miles southward of the cape rises 4,157 feet above the sea; its rugged, precipitous sides and bluff cone-shaped rocky summit render it conspicuous and most useful in fixing a vessel's position at a distance.

With the exception of Ghertis, a large rock above water 1 mile eastward of Cape Anapomera (the northern extremity of Khios) and about 700 yards from the coast, there are no off-lying dangers along the northern coast of Khios at a prudent distance, nor is there anything to induce a vessel to be in close proximity to the land.

Port Marmaro runs in about 1 mile and has depths of from 14 to 3 fathoms, mud bottom. The officer commanding the British naval vessel *Fawn* in December 1879, writes: "Port Marmaro, though apparently an admirable harbor in southerly winds, has bad holding ground. The *Fawn* anchored in 7 fathoms water, near the head of the port, and with a long scope of cable dragged twice with a clear anchor, and even moved after a second anchor had been let go. There is a great deal of weed at the bottom. The wind was from south, force 8, in squalls which came down the valleys with great suddenness. No directions are necessary for entering this port, but as a shelter it is well to avoid it altogether."

Digitized by Google

Port Parapanta.—At about 6 miles southeastward of Cape Anapomera and immediately eastward of Port Marmaro Islet is an inlet open to the northward, with depths of 14 and 10 fathoms, mud bottom, called Port Parapanta. Off the point which separates the two ports is Margariti Islet, under the southwestern side of which there is anchorage for a small vessel.

Coast.—From Cape Pampakas, the eastern entrance point of Port Parapanta, the coast trends to the southeastward for 2 miles to Cape Vrulidia, a prominent headland. At ¾ mile from the cape and 800 yards from the shore is Glastri, a large rock above water with a rocky shoal on its western side; rocks also project from the coast between. There are 35 and 38 fathoms water close to Glastri Rock.

Strovilo Islet, close off Cape Vrulidia, has a passage inside it for boats. Strovilo Islet is conspicuous and of a conical form with a few rocks at its base, but the water is deep near it.

From Strovilo Islet a bold cliffy coast trends to the southward for 1 mile to Cape Kaminaki, which, as well as the coast to the southward, is bordered by rocks. Thence the coast trends to the southward for another 2¾ miles to Port Kolokithia, being broken and steep-to.

Port Kolokithia extends westward about ¾ mile and is more than ½ mile wide, with from 30 to 10 fathoms water, but in the middle of the entrance there is a patch with 6 fathoms water. The port is separated from the inlets to the southward by Cape Sidero, on the northern side of which a shoal extends more than 200 yards northward. The usual anchorage is in the southwestern corner, off the valley in which are some houses, in from 20 to 10 fathoms water, mud bottom. A small stream runs into the sea during winter.

In the northwestern corner of the port is a small green islet, with a passage inside it for boats, and having a cove on each side; the western cove is shoal and muddy, and a good place to beach a vessel in case of necessity; the eastern cove is nearly 400 yards wide, from 15 to 6 fathoms deep, and a small vessel may anchor here and make fast to the shore.

From the cove to the northern point of entrance to the port the shore trends eastward, and with the exception of a small rock above water about 400 yards from the cove, and steep-to, the coast is clear and bold.

Water may be obtained from a spring.

St. Stephano Islet, about 400 yards in length, low and rocky, is ½ mile southeastward of Cape Sidero, and fronts two inlets extending to the southwestward and southward, fit for small vessels; at the head of the inlets are salt springs.

East coast of Khios.—The shore for about 6 miles southward of St. Stephano Islet forms one or two little points, and after the

Digitized by Google

first 2 miles is bordered by a narrow bank, but beyond the distance of about 700 yards the water is deep; in the northern portion are one or two coves and the shore is steep-to.

Port Scio or Kastro, 6 miles southward of St. Stephano Islet, is nearly rectangular in shape, the basin being walled around by quays and protected from the sea by two moles. The length of the harbor is about 750 yards and breadth 360 yards. The central portion is dredged to a depth of 30 feet and the rest to 13 feet, excepting that alongside the south quays and north mole there is only a depth of 6 feet. The north mole extends 270 yards 142° to the ruined fort, and then 160 yards 119° 30′. The south mole runs straight 355 yards 342°; the width of the entrance is 115 yards.

On the north mole and near the ruined fort are situated the health office and harbormaster's office.

On the northern side of the port is the citadel, surrounded by Scio, the town and capital of the island, which, with the suburbs, extend between 3 and 4 miles along the coast, and being interspersed with trees and gardens has a pretty appearance from the sea.

Light—North mole.—On the outer end of the mole, at an elevation of 29 feet, is a fixed light, showing green seaward and red over the port.

From the southern end of the fort two fixed red lights, placed vertically, are shown. (See Light List.)

Light—South mole.—On the outer end of the mole, at an elevation of 29 feet, a fixed light, showing red seaward and green over the port, is visible 3 miles.

Directions.—The coast bank is very steep, deepening in places from 9 to 14 fathoms, then 18, and the next cast no sounding with hand lead. The best way to choose a berth under sail is to close with the shore and approach the anchorage before the wind, avoiding any spits of white water that may be seen and round out into the necessary depth.

Depths.—The 4½-fathom shoal shown on the charts 350 yards 1° from the head of the north mole, does not exist; a sounding of 8¾ fathoms has been obtained in this position.

Midway between the 4½-fathom shoal mentioned above and the 4¼-fathom shoal 200 yards farther westward a depth of 7 fathoms was found.

Anchorage.—The anchorage off the town of Scio commences at about ½ mile southward of the entrance to the port and continues as far as 2 miles northward of it. A large vessel should be in from 12 to 18 fathoms water; a good berth is in 12 fathoms, muddy bottom, at about ¾ mile northeastward of the citadel. A berth will also be found abreast of the northern range of windmills, which stand on a kind of beach and are the third range of mills from the port. A

Digitized by Google

vessel may anchor nearer the port, but the holding ground is not so good, the bottom being soft mud, and in getting under way in a sailing vessel the anchor comes away before the chain is up and down.

A good anchorage for heavy-draft vessels may be found in 16¾ fathoms water, on the bearings: Citadel, right tangent, 280°; north mole, left tangent, 234°.

Being near the port is more convenient for boats, which is a consideration in the autumn months, when the northeasterly winds blow with great violence, causing at times a considerable swell and rendering it difficult for them to return to the shore.

Telegraph cables.—Five cables are landed at a cable house situated about 1 mile southward of the entrance to the port. One starts in a northerly direction for Tenedos Island, two are laid to Chesme across the strait, and the other two go to Syra. Vessels should avoid anchoring over them.

Coal.—No coal is kept in stock.

Water is supplied in open lighters, but is expensive.

Hospital.—This is a spacious, well-appointed institution, free to all, irrespective of creed and nationality.

Communication.—The Austrian Lloyd's steamers call fortnightly, Russian steamers weekly, Deutsche Levante monthly, and others frequently. There is telegraphic connection with the general system.

Cape St. Helena, 2½ miles to the southward of Port Scio, is a low rugged point, rising gradually to a round hill, upon which is an old tower, and it should be given a wide berth to avoid the elbow of the shoal southward of it, which is steep-to; the white sandy bottom at times is plainly visible when in its vicinity. The coast to the northward is bordered by a bank.

Katomeri Point is 1 mile to the southward of Cape St. Helena. Between the point and Cape St. Helena, 1 mile northward of it, the shore forms a small bay, with shallow water extending seaward nearly 1,400 yards.

Megalo and Kalamuti Bays.—These two bays on the southeastern side of Khios, separated from each other by the land terminating in the cliffs of Capes Gredia and Nenita, are convenient stopping places for vessels bound through Khios Strait during strong northerly winds.

Megalo Bay is southwestward of Katomeri Point. In the northern part of the bay there is also anchorage during northerly winds in 8 to 10 fathoms, sand and weed, with Paspargo Lighthouse bearing about 91°. Within the bay are the mastic plantations, from the cultivation of which a considerable revenue accrues. This shrub does not thrive in any other part of the island, and it has often been tried without success.

Digitized by Google

Cape Nenita, the southern extremity of Megalo Bay, is formed by steep white cliffs with flat tops and on its southern side is a ruined tower.

In Kalamuti, the southernmost bay, vessels may anchor in the northern part where convenient, in 16 to 14 fathoms, sand and weed.

Water may be obtained in Kalamuti Bay.

Current.—The current round this end of Khios is strong and uncertain, but in Kalamuti Bay it generally sets to the northward.

Paspargo and **Panaghia Islets.**—These little islets lie near the middle of the southern entrance to Khios Strait and are rather more than ½ mile apart, with from 8 to 13 fathoms water between them, excepting midway, where there is a 4-fathom rocky patch. The northern end of Paspargo is skirted by rocks, and rocks lie off each end of Panaghia. The passage between the former islet and Khios, as also that between Panaghia and Cape Bianco, are clear of danger, except the narrow shore banks.

Light.—On the summit of Paspargo Islet is a white stone tower, from which is exhibited, at an elevation of 138 feet above the sea, a fixed white light, visible 12 miles. (See Light List.)

Khios Strait, separating the island of Khios from the mainland, is narrowed at the southern entrance by the islets of Paspargo and Panaghia, but the passages between Paspargo and Khios and between Panaghia and the mainland are wide and clear.

Northward of these islets the strait is wide and also clear, if we except the Kumuthi Shoals on the eastern side. Northeastward of these shoals is the island of Goni, in front of the bay of Eritra on the south. In the northern part of the strait the Spalmatori Islands lie in an oblique direction across it, leaving deep and clear channels on either side of them; the channel between the southeastern end of the islands and the mainland being upward of 3 miles wide.

Khios Strait affords several anchorages and stopping places, such as the bays immediately north and south of Cape Bianco, Kalamuti, Megalo, and Chesme Bays, Port Kolokithia, and the anchorages in the Spalmatori Islands. It is well lighted, and with the most ordinary attention its navigation is easy. As no ordinary vessel can work to windward during strong north or northeasterly winds with a lee current, it will be necessary under such circumstances to seek an anchorage until the wind moderates, when it will be succeeded by a strong southerly wind and northerly current.

Currents.—In the strait of Khios between Cape St. Helena and Cape Bianco and in the channels on either side of the Spalmatori Islands, with fresh north or northeasterly winds, no ordinary sailing vessel can work to windward, but must anchor in one of the bays already mentioned until a change takes place, when with a southerly wind the current will run strong to the northward.

Digitized by Google

Mainland coast.—Cape Bianco (ancient *Argennum Promontory*), as its name implies, consists of white cliffs of moderate elevation, conspicuous from the southwestward, and in shape somewhat resembles the Bill of Portland, on the south coast of England. The southwestern face of the cape is bordered at a short distance by shoal water, and its northern extremity is also bordered by a rocky shoal, which extends off nearly 400 yards. The distance, however, between the rocky shoal and Panaghia Islet westward of it, is ¾ mile. (For coast to southward of Cape Bianco, see p. 335.) Between it and Kezil Point, nearly 3 miles northeastward, the coast, which is white chalk cliff, bends southward and forms a bay. At about ¾ mile eastward of the northern part of Cape Bianco is a little islet surrounded by shoal water, lying within the 5-fathom curve of soundings, which passes round the southern side of the bay more than ½ mile from the shore; within this distance the water is shallow.

Temporary anchorage.—During strong southerly winds there is anchorage in this bay northeastward of the northern part of Cape Bianco, in 10 to 12 fathoms over coarse sand, good holding ground, for any number of vessels, but they should be prepared to leave in the event of a change of wind to the opposite quarter.

Chesme Bay.—Kezil Point, the southern entrance point of Chesme Bay, projects northward, is of a red color and steep-to on the western side, but shoal water extends a little northward and along the shore eastward of the point at the distance of 200 yards.

Light.—On the extremity of Kezil Point is erected a lighthouse from which, at an elevation of 65 feet above the sea, is exhibited a fixed white light, visible 10 miles. The light shows very faintly over the bay, when bearing westward 236°. (See Light List.)

Kaloyeri Reef lies in the approach to Chesme, and, within the depth of 5 fathoms, is 750 yards in length northwest and southeast and from 200 to 300 yards in breadth. On it are several rocks awash, or with less than 1 fathom water, and over other parts 2 to 4 fathoms; close to its edge there are from 8 to 13 fathoms. The outer part of the reef, with depth of 5 fathoms, bears 294°, 1 mile from Kezil Point Lighthouse.

Beacon.—Near the center of the reef is a conical beacon about 10 feet high, from which Kezil Point Lighthouse bears 111°, 1,550 yards. From a similarity of color the beacon is not easily discernible when seen against the land.

Cape Mastiko, the southern extremity of Khios, open southward of Cape Gredia, and also just open of the land of Cape Bianco, bearing 230°, leads southeastward of the reef; but there will be no doubt about clearing the reef if Kezil Point Lighthouse is passed within the distance of ¼ mile.

At night, from the northwestward, keep Kezil Point Light bearing southward of 131°.

Digitized by Google

Kara Dagh Point is a broad headland on the southern side of Chesme Bay, dividing Aiasmata Bay from Chesme Harbor.

Anchorage.—There is anchorage at 700 yards eastward of Kezil Point Lighthouse in about 10 fathoms, good holding ground. Nearer the town the bad holding ground, as shown on the chart northward of Kara Dagh Point, is about 350 yards in length in an east and westerly direction and 150 yards in breadth, with rocky bottom; trading steamers anchor farther northward, where the holding ground is good. Large vessels may choose a berth where convenient northeastward of the lighthouse in 15 or 16 fathoms, mud.

Telegraph cables.—Two telegraph cables are landed on the southeast side of Aiasmata Bay.

Chesme town (ancient *Kyssus*), on the eastern side and near the head of the bay is pleasantly situated partly on the face of a slope, crowned by the ruins of an old castle. It contains several mosques, a Greek Church, public baths, customhouse, and numerous coffee houses.

Trade.—A great quantity of raisins are exported, and nearly all the fruit sold in the British Islands as Smyrna raisins are grown in this neighborhood.

Population.—The population is about 7,500.

Communication.—Chesme is connected with the general European telegraph system. Austrian Lloyd's steamers call fortnightly, connecting with Trieste, Piræus, Smyrna, Constantinople, Constantza, etc., and other steamers call frequently.

Kumuthi Point.—From Chesme the coast, which is clear of danger, trends northward, gradually decreasing in height to Kumuthi Point, a distance of 3 miles. Kumuthi Point is low and surrounded with rocks; it forms with Paramesa Point, 1.3 miles eastward, the entrance of an inlet, 1¼ miles deep, having from 18 to 5 fathoms water, mud bottom. There is a narrow passage northward of Kumuthi Point into Eritra Bay, which may be used by small vessels rounding the point carefully and feeling the way in by the lead.

Kumuthi Shoals are a cluster of rocky patches on a bank extending 1½ miles northward of Kumuthi Point, with deep water close-to on their western and northern sides. Some of the rocks are nearly awash, others have less than 6 feet water on them and in places 2 and 3 fathoms, with deep water between. Near the western edge of the bank and a little more than ¾ mile 325° from Kumuthi Point is Kumuthi Islet, about 150 yards in extent, oval in form, and composed of red earth and loose stones.

Kumuthi Shoals are the chief danger in the navigation of Khios Strait; the bottom is so level and deep and the bank so steep-to that soundings will not indicate approach, and therefore when passing

Digitized by Google

them a vessel's position should be checked by bearings. The line joining the two lights of Paspargo Islet and Pasha Island passes 1 mile westward of these dangers; to insure safety, therefore, when in their vicinity Paspargo Islet Light should be kept bearing southward of 200° and Pasha Island light eastward of 20°.

In that case with Kezil Point Light bearing 165° a vessel will be to the northwestward of the shoals. The southern extremities of Makro and Platia Islets in range, bearing 82°, lead northward of Kumuthi Shoals.

Eritra Bay.—This extensive bay is eastward of the peninsula of which Kumuthi and Paramesa Points are the northern extremities. Its shore is irregular, with several projections, bays, coves, islets, rocks, and shoals, and for the navigation of which the chart must be the guide. The northeastern part of the bay is covered by the promontory of Mavro Vuni (the summit of which is 1,044 feet high), projecting nearly 3 miles southwestward. The angle which it makes with the coast on the south is called Mavro Vuni Bay. At the head of this bay there are anchoring depths, as well as in places along the coast southeastward of it.

The town of Eritra (ancient *Erythræ*) is on the shore in the southeastern part of the bay westward of a peninsula extending 3 miles northwestward and terminating at Keras Point, but the town is of no commercial importance. The town is fronted by several islets and shoal patches.

Goni Island is the largest of a group of islands in front of the bay of Eritra, between Kumuthi Shoals on the southwest and the promontory of Mavro Vuni on the east, having passages on either side of the group. The islands occupy a space of 4 miles east and west and about half this distance north and south, and with Kumuthi Shoals may be considered part of the eastern boundary of Khios Strait.

Makro Islets, the two western of the above group, are close together, with from 9 to 28 fathoms between them and Kumuthi Shoals. The passage between these islets and Goni Island is deep, but narrowed by a large rock above water rather nearer Goni and other rocks uncovered near the southeastern end of Makro.

Meso and Platia, the two eastern islets of the group, are united by a reef. The passage between Meso and Goni is deep, and about 700 yards wide; a large rock above water, lies at the southern entrance. The passage between Platia and the promontory of Mavro Vuni is clear and deep and 1,200 yards wide.

Trago Rocks, above water and surrounded by others under water, are ¾ mile to the eastward of Mavro Vuni Point, the southern extremity of the peninsula of the same name.

Spalmatori Islands.—These islands, in the northern part of Khios Strait, consist of two large islands and numerous islets, and

Digitized by Google

together occupy a space of 6¼ miles in a northwest and southeast direction, with irregular coasts.

Agnussi, the largest and westernmost of the group, is 4½ miles in length and its most elevated part, toward the western end, is 555 feet high. A hill with a beacon on it about 1 mile from the southeastern end is 478 feet high and is called Beacon Peak.

Agnussi Reef.—The northwestern end of Agnussi is bold, but a reef which borders the western face of this end of the island extends nearly 400 yards northward from the northwestern extremity of Agnussi Island. With this exception and the reef bordering Cape Kaminaki, the passage between Spalmatori Islands and Khios is nearly 1 mile wide, clear and deep, and is called Spalmatori Channel.

Temporary anchorage.—There are anchoring depths eastward of Agnussi Reef, over coarse sandy bottom, and in case of actual necessity a steamer might drop an anchor here during southerly winds, but it would be necessary to leave directly any indication of a change took place. This is the only place to anchor on the northern side of these islands, the water elsewhere being too deep.

Kio Islands are two small flat islets close together and surrounded by shoal rocky ground which extends off north and south rather more than 200 yards. These islets lie 1.1 miles southeastward of Cape Kaminaki of Khios and 1,400 yards from the shore of Agnussi Island.

Rock awash.—At ½ mile 120° from the Kio Islets and 700 yards from Agnussi is a rock awash with shoal water around it. The water is deep near these islets and rock, and they should be given a fair berth.

Mandraki Islet is the outermost of three low islets situated on a bank extending from the southwestern coast of Agnussi between two inlets, and separated from the shore and from each other by boat passages.

Shoal patch.—At about ¼ mile southeastward of Mandraki Islet is a shoal patch with 4 fathoms water on it.

Rock.—At rather more than ¾ mile eastward of Mandraki Islet is a cliffy point, the southern termination of Beacon Peak, off which at 400 yards from the shore is the outer edge of a rocky patch with less than 1 fathom water on it and 10 fathoms between it and the coast.

Between the cliffy point and the southeastern end of Agnussi there are two small inlets with from 8 to 3 fathoms water.

Anchorage will be found in places along the southwestern side of the Spalmatori group, the bottom sand and mud or sand and weed, available during strong northeasterly winds.

Pasha Island is nearly 2 miles in length, and its northern end is separated from Agnussi by a narrow passage, with 2 fathoms water, leading into Port Boghazi on the south. The little bays on the

Digitized by Google

western side of Pasha Island with those on the eastern end of Agnussi and the islets fronting them form the Ports of Pasha and Boghazi.

Light.—Situated 280 yards from the eastern extremity of Pasha Island is a white stone tower, from which is exhibited, at an elevation of 246 feet above the sea, a flashing white light, except when obscured by the land visible 18 miles. (See Light List.)

Port Boghazi is the western and narrower of the two ports, and the entrance is between the shoal bordering Gavathi Islet, 150 feet high, and the reef extending southward from the islet of Arkondo on the northwest. The channel to the anchorage is nearly 1 mile in length and carries from 20 to 10 fathoms water. The anchorage is northward of Pondiko Island in from 10 to 12 fathoms, sand, with better shelter from southerly winds than Port Pasha affords.

Port Pasha is between the island of the same name and Vaton Island on the east and Gavathi and Pondiko Islets on the west. This port is open to the southward, and the bottom is irregular and rocky. A narrow passage, 4 fathoms deep, between Gavathi and Pondiko Islets leads from Port Pasha to Port Boghazi.

Vaton Island is surrounded by a reef and separated from Pasha Island on the north by a narrow 4-fathom passage.

Shoal.—At the western end of Vaton is a small islet, and 300 yards northwestward of the islet is a rocky shoal with 2 fathoms water on it.

Bank.—A bank with 4¾ fathoms water on it lies ½ mile 120° from Pasha Island Lighthouse and 800 yards 66° from Cape Turko, the southeastern extremity of Pasha Island.

Caution.—The soundings in this locality not being in sufficient detail, caution must be used in approaching the shores.

Egri-liman Channel.—The passage between Pasha Island and Utch Islets southward of port Egri-liman is 3⅓ miles wide, clear and deep, and called Egri-liman Channel.

Port Egri-liman.—The entrance to this port (ancient Phœnicus) is rather more than 4 miles 58° from Pasha Island Lighthouse. The western side of the port consits of a narrow, irregular, cliffy peninsula trending northward parallel to the coast for 1.2 miles. It is a narrow inlet open to the north, 400 yards wide at the entrance, which width gradually decreases to about 200 yards, 1,200 yards from the entrance, whence to its head is a mud flat with from 3 to 1½ feet water over it. The depth of the port varies from 12 fathoms near the entrance to 6 fathoms near the commencement of the mud flat just mentioned. Local vessels frequently seek shelter in this port.

Beacon.—A white beacon, on a hill 108 feet high, stands near the northern end of the peninsula.

A shoal with 2½ fathoms water on it lies 250 yards off the northern extremity of the peninsula, bearing 400 yards 328° from the beacon.

Digitized by Google

Utch Islets.—Two-thirds of a mile southward of the extremity of the peninsula are Utch Islets, a cluster of three little islets and rocks extending nearly 600 yards from a rocky point and steep-to.

Rakos Islets lie nearly 1,200 yards farther south and about the same distance from the coast as Utch Islets. There are 6 fathoms water about 400 yards southwestward of Rakos Islets.

Shoal patch.—One-third of a mile southeastward of Rakos Islets, off the western entrance point of a bay, is a shoal patch with 2 fathoms on it.

The coast from Mavro Vuni Point northward to Port Egri-liman is high and bold.

Garen Rocks.—At about 1¾ miles northward of the entrance to Port Egri-liman are Garen or Black Rocks, above water, extending about ¼ mile from the south entrance point of a small indention known as Garen Cove. Two rocks, with less than 1 fathom on them, also lie about 600 yards 254° 45′ and 232°, respectively, from the southern extremity of this point. At ½ mile northward of Garen Rocks is another sunken rock, ¼ mile from the shore. All these rocks are steep-to.

The peak of Mavro Vuni open westward of Egri-liman Peninsula 152° leans outside or westward of these dangers.

Peninsula of Kara Burnu—Kara Burnu.—From Garen Rocks the coast trends northward 6 miles to Kara Burnu (ancient *Melæna*), known by its steep dark cliffs. Southwestward is a large rock or islet close to the shore, and over the cape on a hill are three windmills.

Kumur Baba.—At 3 miles eastward of the cape is Kumur Baba, the eastern termination of a steep cliff 1,400 yards in length, and the most northern part of the peninsula of Kara Burnu.

The peninsula of Kara Burnu, between the shores of Eritra Bay on the west and the Gulf of Gul-baghche on the east, where it is nearly 3 miles across, extends northward nearly 16 miles, with an extreme breadth of about 9½ miles, and the summit of Boz Dagh, its greatest elevation, is 3,906 feet high. Its coast is high and bold, nearly everywhere clear of danger, with deep water at a short distance. In sailing vessels the shore of the peninsula should not be approached too near, as the wind may become light.

Peak of Mimas.—Between Kumur Baba and Kinlu Point, 2 miles eastward, the coast forms a slight bay. Kinlu Point is a bold dark bluff and steep-to. At 1½ miles southward of the point is the remarkable peak of Mimas, in the form of a sugar loaf and 1,724 feet high; it rises from the northern part of the Boz Dagh, the elevated chain of mountains which runs through the peninsula of Kara Burnu from the south; it is an excellent mark and visible from all directions seaward.

Digitized by Google

Coast.—The islet of Buyuk Sahib is 2 miles east-southeastward of Kinlu Point. The first part of the coast between is cliffy and steep-to, but Tuzla Point, about halfway is rocky, and shoal water extending on more than 200 yards borders the shore southward round Port Sahib.

The islet of Buyuk Sahib is ½ mile in length northeast and southwest, 168 feet high, and bears a near resemblance to the Bill of Portland, the southwestern end being a steep white cliff, declining with a gentle slope to the northeast, where it is also bold and steep-to. With the exception of the northwestern part, the islet is bordered all round by a narrow shoal, and rocks extend off 150 yards from its southwestern extremity.

Shoal.—Northwestward of this end of the islet is a rocky shoal 300 yards in length northeast and southwest, with less than 1 fathom water on its central part. The western end of the shoal is 400 yards from the islet, and in the narrow passage between there are from 6 to 10 fathoms water. This shoal is separated from the bank off the shore of the peninsula by a passage 400 yards broad.

At 650 yards southward of Buyuk Sahib is Fanar Burnu, a point projecting slightly to the north, and on a hill 299 feet high a little within it are three or four mills. Off the northeastern face of the point is another islet, Kuchuk Sahib, 600 yards in length and bordered by a narrow shoal, with a narrow channel 4½ fathoms deep midway between it and the shore.

Port Sahib.—On the western side of Fanar Burnu is a bay which forms with Buyuk Sahib Islet, on the north, Port Sahib, with depths of 20 to 10 fathoms, mud bottom. The port is open to the northeastward, fit only for small vessels, and not much frequented. It is subject to strong and sudden gusts of winds off the land. The southeasterly winds at times blow with much force out of the Gulf of Smyrna, when shelter may be found in this little port. At the head of the bay is a little village and a pier.

There is no danger in entering between Buyuk Sahib and Kuchuk Sahib. In the northern passage keep about 400 yards from the shore and in not less than 6 fathoms water until in the port.

Water and small supplies of provisions may be obtained.

Gulf of Smyrna.—Kinlu Point of the peninsula of Kara Burnu and Cape Hydra (Aslam Burnu) may be considered the western and eastern entrance points, respectively, of the Gulf of Smyrna. From a line between Kinlu Point and Cape Hydra, which bear from each other 74° 45′ and 254° 45′, distant a little more than 13 miles, the Gulf of Smyrna trends in a south-southeast direction 22 miles, then eastward about 12 miles to the anchorage off the town of Smyrna. Its breadth varies, but narrows as the inner part is approached, when the channel becomes irregular and contracted. The soundings

Digitized by Google

which are from 43 to 45 fathoms in mid-channel at the entrance, gradually decrease toward the head, and temporary anchorage will be found in case of necessity all over the upper part of the gulf.

The shores of the gulf are opposite in character; the southwestern is high and steep, being the base of high mountainous land, while a large portion of the northeastern is a low broken shore with lagoons backed by a plain, but the channel is well lighted and the navigation easy.

A description of the southwestern side of the Gulf of Smyrna, including the Gulf of Gul-baghche as far as Vourlah Road, will now be given, following which, the eastern shore from Cape Hydra will be described.

Coast of Kara Burnu Peninsula.—The coast from Port Sahib trends in a general south-southeast direction nearly 13 miles to Cape Aspro. A sunken rock lies close to Dirsek Point, and between Artez Point and Cape Aspro the shore is bordered by shoal ground, which extends off the eastern side of the cape a distance of nearly 600 yards.

Gulf of Gul-baghche.—Cape Aspro is the northwest entrance point of the Gulf of Gul-baghche. From this cape the gulf extends southward 9½ miles, decreasing from 3½ miles in width at the entrance to 1.6 miles at its head. In the middle, at 1¼ miles from its head is the islet of Hermo, 800 yards in extent, and connected to the eastern shore by a 2-fathom flat, which borders the shore all round the upper part of the gulf from Kalabak, a point on the eastern shore 1 mile northward of the islet. Southward of the islet and between the projecting parts of the flat there are depths of 3 and 5 fathoms. The soundings, from 15 fathoms at the entrance of the gulf, decrease to 6 and 5 fathoms at ½ mile from Hermo Islet. The eastern shore of the gulf should be avoided, as it is bordered by shoal water, and about halfway between the end of the promontory (forming the southeastern entrance point of the gulf) and the head of the gulf is a detached shoal of 2 fathoms, ½ mile from the shore. The shoal is also 1½ miles northward of Kalabak Point, just alluded to.

Anchorage.—Vessels at times during northerly winds anchor under Cape Aspro in from 10 to 15 fathoms water. In steering for this anchorage the eastern point of the cape should be given a wide berth. Vessels in this vicinity should be prepared for the heavy squalls which occasionally descend from the highland.

Prohibited zone (1914).—All vessels are prohibited from entering that portion of the Gulf of Smyrna which lies southward of a line beginning at Cape Aspro and passing eastward through the southern extremity of Chustan Island to the eastern coast of the gulf.

Chustan or Long Island.—This island, in the middle of the Gulf of Smyrna, is nearly 5¾ miles in length in a north and south

Digitized by Google

direction, about 1¾ miles in extreme breadth, and its most elevated part (upon which is a beacon), near the center, is 627 feet high. Its coast is slightly irregular and is bordered by a narrow shoal, which at the southwestern shoulder of the island extends off 700 yards, with a small islet on it and rocks awash near its extremity.

Chustan Point, the northern point of the island, is a narrow tongue of moderate height, and steep-to; nearly 1 mile southward of it, close to the western shore, is a little islet with 4 fathoms water inside it.

At the southwestern part of the island is a bay formerly known as English Harbor, with depths of 17 to 8 fathoms, but in the eastern part are rocky patches with from 4 to 5 fathoms water on them. A tongue of shoal ground with 3½ and 5 fathoms water over it extends 700 yards southward from the southern end of the island.

On the eastern side of the island, at about halfway between the north and south points, the coast forms a bay with from 5 to 16 fathoms water; Long Point, the southern extremity of the bay, is a cliffy projection of a grayish color, and over it is a peaked hill of similar appearance.

Tribune Rock.—At 1,050 yards 353° from the outer part of Long Point and 1,300 yards from the shore to the west is Tribune Rock, with 2 fathoms water on it and 4 and 5 fathoms around. The northern point of Yilanejah Island bearing 157° well open eastward of Kilsali Island leads eastward of the rock, but a better mark is to keep nearly the whole of Yilanejah open.

Passage west of Chustan Island.—Chustan Island is separated from the coast of Kara Burnu Peninsula by a passage 2½ miles wide, having from 6 to 20 fathoms water. The central part is clear, but the coast on either side should not be approached too closely, especially the shoal points at the southern end of the passage.

Shoal.—The passage between Chustan Island and the shore of the promontory southward of it is 1.4 miles wide, but a shoal of hard sand and stones with 2¼ fathoms water on it and about 400 yards in extent lies in the fairway, its northern end bearing 1,300 yards 347° from the eastern point of the bay in the north end of the promontory just alluded to.

Clearing marks.—When passing southward of the shoal bring the northeastern extremity of Penarli Island in range with the northeastern sides of the Yasajah Islets bearing 126°, which will lead southward of the shoal and also the 5-fathom rocky patch 1,600 yards northwestward of it. The extremity of the little peninsula northwestward of Vourlah Road in range with the point north-northwestward of it bearing 153°, leads northeastward of the shoal.

Kilsali Island is 1.2 miles in length, nearly ¾ mile in average breadth, with a hill at its southern end 370 feet high. Its western

Digitized by Google

and southeastern coasts are bordered by shoal water, and in places the depth of 5 fathoms is nearly 500 yards from the shore, which should be given a wide berth in a vessel of heavy draft. The passage between its northwestern end and Chustan Island is 1,300 yards wide and in the fairway from 16 to 25 fathoms deep.

Marathussæ Islands.—Southeastward of Kilsali is a cluster of islands and islets, the principal of which are named Yilani (flat, and very little above water), Yilanejah, Penarli, Akjadah, and Yasajah. These islands are each surrounded by shallow water, excepting the first three, but have deep though, in some cases, narrow passages midway between them. Between Yilani and Yilanejah the depth is 10 fathoms and between the latter and Penarli 6 fathoms.

Caution.—As many of the soundings on the large scale chart have been enlarged from a smaller scale, extra caution must be used in approaching the shores.

Yasajah Island, 89 feet high, is the westernmost of the four largest of the cluster just mentioned. It is 800 yards in length north and south by 350 yards in greatest breadth, its southern point being sharp and narrow. Two small islets lie northwestward from its northern extremity, the outer one being ¼ mile distant and the other about half that distance.

Rocks with less than 1 fathom water on them lie 400 yards westward from the northern end of Yasajah.

West-southwestward 1,600 yards from the southern point of Yasajah Island, is the outer part of a little peninsula of the main shore. The island and peninsula are connected by a bank with depths under 10 fathoms, and on this bank a patch with only 3 fathoms lies 400 yards from the southern point of Yasajah Island; a patch of 4 fathoms lies 700 yards from the peninsula.

Clazomenæ Islet, 1,300 yards in length, is situated with its outer end bearing 131° distant 2 miles from the extremity of the little peninsula just alluded to, the coast between them forming two bays. Clazomenæ Islet, together with Injerli, a small islet lying 400 yards northward of its outer extremity, shelter the southeastern and larger bay from the eastward. Further protection is afforded by the remains of the ancient breakwater connecting Clazomenæ to the shore. A new breakwater connecting the islet with the shore has been constructed 8 yards to the eastward of and parallel to the remains of the ancient breakwater; it has three arches under it, the southern one being navigable for small boats. On the island end is a guard-house and telegraph station; the poles run along the breakwater. On the south end there is a small lighthouse about 20 feet high, from which an occasional fixed white light is exhibited. This islet contains the quarantine station.

Digitized by Google

Buoy.—A red buoy is situated at the entrance to the port of Lazaret de Clazomenæ, on the western side of this islet.

Vourlah Skala is the name of the landing at the head of this bay for the town of Vourlah, which, with a population of about 25,000, is situated 2½ miles southward. The depths in this bay are irregular, varying from 3 to 10 fathoms. Two 3-fathom patches are situated 550 and 800 yards, respectively, 316° from the southern extremity of Clazomenæ Islet.

Communication.—A coast road and daily steamer connect Vourlah Skala with Smyrna, distant 18 miles; a good road also connects Vourlah with Chesme.

Vourlah Road.—Bearing 159° and distant nearly 1 mile from the little peninsula already mentioned, is the point separating the two bays. The shore of the northwestern bay recedes from this line 800 yards. The 3-fathom curve is very little inside the line joining the peninsula and point, and off the extremities themselves not more than that depth will be found at the distance of 200 yards.

The space between this shallow bay and the islands Yasajah and Penarli is known as Vourlah Road, with depths of from 4 to 15 fathoms over mud and weed.

Directions.—Vessels may enter Vourlah Road by the passages between any of the larger Marathussæ Islands covering the roadstead, or between Yasajah, the western island, and the little peninsula.

Approaching Vourlah from the westward of Chustan Island, give the islet on the rocky shoal at its southwestern part a berth of 600 yards in rounding, then keep the southern Yilani Islet in range with the south point of Kilsali 121° until the little peninsula (near the roadstead) is open of the point north-northwestward of it. Now steer a mid-channel course for the passage between Yasajah and the little peninsula, giving a berth of 400 yards to the sunken rocks westward of the north end of Yasajah.

When the southern end of Yasajah and the northern end of Penarli are in range bearing 108°, bring the highest part of Kilsali just open westward of the outer of the two islets at the northern end of Yasajah bearing 1°, which mark will lead over the bank extending from the southern point of Yasajah Island to the little peninsula, in the deepest water, between the 3-fathom and 4-fathom shoals already alluded to.

When approaching the roadstead from the eastward of Chustan Island, the passage between Yasajah and Akjadah is the wider, but a vessel should keep in mid-channel, and Yasajah should be given a berth of at least ¼ mile to avoid the shoal surrounding it. A shoal also extends 150 yards westward from Akjadah, but a mid-channel course will clear it.

Digitized by Google

The safest passage to Vourlah Road, however, for a large vessel, is eastward of all the Marathussæ Group and between Penarli and the little islet of Injerli, giving a berth of 400 yards to the southern end of Penarli. This channel between the 5-fathom curve 200 yards southward of Penarli, and the same depth 200 yards northward of Injerli Islet, is 1,200 yards broad, with depths of 10 to 14 fathoms. The passage between Yilanejah and Penarli is limited by shoals extending into it from either island, and there is no occasion to use it.

Moor in Vourlah Road with open hawse to the northward.

Water.—A plentiful supply of water is procurable from a spring on the coast, situated about 700 yards southward of the little peninsula.

Supplies of fresh provisions may be had at reasonable prices.

South shore of the gulf.—From Clazomenæ Islet, already described, the south shore of the gulf trends eastward about 12 miles to a low projecting point called Sanjak Kalessi, with a battery on it (Yeni Kale). The shore is backed by high hills, and 2 miles inland and 4 miles southwestward of Sanjak Kalessi are two peaks of a mountain close together, 2,864 and 2,922 feet, respectively, above the sea, named the Two Brothers, which form a prominent landmark. The shore is all along clear of danger, and may be approached to a reasonable distance.

North shore of the gulf—Cape Hydra or Aslam Burnu, the eastern entrance point of the Gulf of Smyrna, is the bold termination of elevated land which at 3 miles southeastward is 1,245 feet high. The cape is steep-to, and near the shore at about ½ mile southwestward of it is a little islet called Kartera, with some rocks.

Iersis Islet, about 700 yards in length, and narrow, with a large rock westward of its central part, and its southern part surrounded by a reef which is steep-to, lies about 2.2 miles southwestward from Cape Hydra. Between this reef and a sunken rock close to the north point of Drepano the passage is about 700 yards wide, with 5 to 9 fathoms of water.

Foujes Harbors.—North and South Harbors of this name may be said to be contained between Drepano Island on the north and the headland of Dava Burnu on the south, the northern extremity of the former being 2¾ miles southwestward of Cape Hydra. The two harbors are separated by an irregular tongue of land 1,400 yards long, and by the islands of St. Georgio and Oglak. St. Georgio Island and the tongue are joined by a ledge with 1 to 1½ fathoms water on it.

Foujes Town is situated at the head of South Harbor and 1½ miles from Dava Burnu.

Digitized by Google

Drepano Island is rather more than 1 mile in length. It is joined to the shore on the east by shoal ground on which is situated a small flat islet, eastward of which is a narrow channel 2 fathoms deep, leading from the north into Foujes North Harbor. The island lies northwest and southeast obliquely to the shore, and on its northeastern side there are anchoring depths in 12 to 18 fathoms, mud bottom, and sheltered from the southwest. A low, hook-shaped sand spit projects from the southern point of Drepano Island in a southeasterly direction 800 yards.

Peta.—The little islet of Peta lies almost 86° from the northern point of Drepano Island, and 250 yards from a point, with which it is connected by a shoal. Shoal water extends also southward and westward 200 yards from Peta.

North Harbor is somewhat circular in shape, the diameter of the area of deep water being about 700 yards. With the exception of the shore of the hook of Drepano, which is moderately steep, the harbor is bordered by shallow water, especially on the eastern side, where not more than 2 fathoms will be found ¼ mile off.

Directions.—In entering North Harbor pass on either side of Oglak Island, between which and the shoal water extending 100 yards from the hook there is a depth of 17 fathoms.

Caution.—The soundings in the survey of this locality not being in sufficient detail, caution must be used in approaching the shores.

Oglak Island, moderately high, lies nearly midway between the outer extremities of Drepano Island and Dava Burnu. It is 700 yards in length by 300 yards broad, being of about the same size as, though lying in a contrary direction to, St. Georgio. It is separated from the latter by a channel 400 yards broad and 8 fathoms deep.

Light.—From the western extremity of Oglak Island two fixed white lights placed vertically are exhibited; the upper light is elevated 105 feet above the sea, and they are visible 12 miles. (See Light List.)

Deirmen Burnu is the easternmost of two prominent points on the southern shore of South Harbor, the western point having on it a Venetian fort, about midway between Dava Burnu and the town. Diermen Burnu is separated from the town of Foujes by a well-sheltered basin about 700 yards in diameter, in which vessels may anchor in 10 fathoms over sand and mud, or secure to the shore. This basin is bordered all around by a narrow bank. A mile southeastward from the town is a hill, on which stand some windmills conspicuous from the offing.

Light.—A fixed red light is exhibited on Deirmen Burnu, elevated 65 feet above the sea, and visible 6 miles.

Digitized by Google

South Harbor is entered between St. Georgio Island and the point with the Venetian fort 800 yards distant; thence the harbor runs in 1 mile, with from 15 to 10 fathoms water, soft mud bottom, which is said not to hold well in the heavy southeasterly gales which blow out of the gulf, coming over the highland in a violent manner.

Dava Burnu is a small dark cliffy peninsula 112 feet high, appearing like an island, and united to the shore by a low sandy isthmus, with a little bay 10 to 5 fathoms deep, mud bottom, on its southern side.

Haji Liman.—This bay, between Dava Burnu and Cape Merminji, and 1 mile from the latter, is ¾ mile deep, 700 yards wide with from 15 to 5 fathoms water, and open to the west-southwest. The northern point of entrance is steep-to, but from the southern point a reef extends nearly 200 yards in the direction of the northern point; and halfway in, on the southern side, is another reef. At the head of the bay is a brook of good water.

Cape Merminji bears 145° and is distant 2¾ miles from Dava Burnu. It is the termination of elevated land, which, at 1½ miles northeastward of it, is 1,030 feet high, and at 1.3 miles northwestward of this height is another hill, 845 feet high. These elevations on either side of the head of Haji Liman are known as North and South Wedge, and are conspicuous by reason of the land dropping suddenly on the south.

Lights.—At 273 yards within the extremity of Cape Merminji, is an octagonal white tower, from which is exhibited, at 230 feet above the sea, a fixed white and red light. The white light is visible 22 miles, and the red 14 miles. (For sectors see Light List, and Chart.)

In the same tower, and below the above light, is a fixed green light, seen through an arc of 33°, and visible about 1½ miles beyond the Merminji Rocks, which it covers.

Merminji Rocks.—This dangerous ledge of rocks shows in places 2 feet above water and is about ¼ mile in extent, with 10 and 8 fathoms all round the shoal. It lies about 1,400 yards mile from the nearest shore (red cliffs) of Cape Merminji, and midway there are 11 fathoms water; but between the ledge and the extremity of the cape is a shoal patch with 3 fathoms on it. During the day these rocks will be seen, and the western end of Oglak Island 348° well open westward of Dava Burnu, leads outside them.

At night the position of the rocks will be known by the green light shown over them from Merminji Lighthouse.

Aggria Bay.—Panagia Point is 2½ miles nearly east-southeastward of Cape Merminji, and between is a projecting point with a large rock or islet close to it, eastward of which is a small bay. From Panagia Point the shore trends northeastward 2½ miles, then south,

Digitized by Google

and southeastward, forming the bay of Aggria, which is very shallow, with all its inner part an extensive fishery, and an inconspicuous islet with ruins on it in the middle.

Anchorage with good shelter and holding ground will be found on the northern side of Aggria Bay, about midway between Cape Merminji and Panagia Point, during north and northeasterly winds.

Coast.—From Panagia Point to Cordaleo, opposite the city of Smyrna, the coast line consists of a low marshy broken shore, with numerous salt pans backed by extensive plains on which wheat is grown during the summer, but which are flooded in the winter. At about 5½ miles south-southeastward from Cape Merminji this broken coast extends westward, forming what may be considered the southern entrance point to Aggria Bay.

This point, 2½ miles broad, is (compared to the rest of this low broken shore) fairly steep-to, 5-fathom curve being found at from 1,200 yards to 1 mile off. The limit of Cape Merminji red light nearly coincides with this line.

To prevent further silting up of Smyrna Harbor a canal has been cut to divert a portion of the water of the Khediz River into Aggria Bay. The mouth of this canal is 800 yards southward of Aggria Islet.

Kokala Burnu or **Fishery Spit.**—From the broad south entrance point of Aggria Bay the low broken-up shore of Smyrna Gulf continues first southeastward, then south and southwestward for some 6 miles to Kokala Burnu, forming a bight 1½ miles deep, from the shores of which, with the exception of the extreme points themselves, not more than 5 fathoms will be found 1½ miles distant.

The end of the drying portion of Kokala Burnu bears 305°, and is distant 3¼ miles from Yani Khediz or Pelican Spit.

The 10-fathom curve passes ½ mile from Kokala Burnu Spit, and a vessel should not approach nearer the point, as the water shoals suddenly to 3 fathoms 200 yards farther in.

Paleo Khediz Spit.—The low irregular shore between Kokala Burnu and Yani Khediz Spits takes the form of a slight bight, off the middle of which the shoal water under 3 fathoms extends 1 mile from the shore, under the name of Paleo Khediz Spit. The outer part of this spit in the depth above mentioned bears nearly 286°, 1½ miles from the dry end of Yani Khediz Spit. A tongue with depths under 5 fathoms extends ¼ mile farther out.

Yani Khediz or **Pelican Spit** is the name given to the most southerly portion of the low broken-up northeast shore and dalta of the Khediz River, the principal mouth of which river formerly emptied on the spit, but which has now been diverted to Aggria Bay.

Lightbuoy.—A lightbuoy, cylindrical in shape, with framework superstructure, painted in black and white horizontal bands, exhib-

Digitized by Google

iting a flashing white light every five seconds, is moored off Pelican Spit. Vessels should pass southward of this buoy.

Clearing marks.—The flat hill westward of Port Iero (Mitylene), open westward of Dava Burnu, 334°, leads westward of the northern portion of the banks extending from the northeast shore of Smyrna Gulf. Mimas Peak seen between the two northern peaks of Chustan or Long Island, bearing 304°, leads southwestward of Kokala Burnu or Fishery Spit and Paleo Khediz Spit.

The extremity of Sanjak Kalessi in range with a remarkable conical peak eastward of Smyrna, bearing 79°, leads southward of Yani Khediz or Pelican Spit.

Smyrna Harbor—North shore.—This shore, which may be said to commence at Yani Khediz or Pelican Spit, partakes to within 1¼ miles of Cordaleo Point of the same low, marshy, broken character as the shore westward of Yani Khediz, being in fact the delta of the Khediz River, several mouths of which formerly debouched into the bay between these points.

The irregular and undefined coast line trends generally in a northeast-by-east direction 7 miles, and then with a more defined character about 2½ miles to Cordaleo Point. In consequence of change in the outlet of Khediz River, the bay thus formed is now occupied by shoal water, with numerous small islands, some covered with rushes and some composed of bare sand.

Sanjak Spit is the name given to the southern part of an extensive flat in the bay just mentioned, its southern extremity with depth of 3 fathoms 3.2 miles bearing 81° from the dry end of Yani Khediz Spit.

Between Yani Khediz and Sanjak Spits, and at nearly equal distances, are the southern extremities of two other shoal tongues called Basake and Swan Spits, the first named being 200 yards, and the last 400 yards northward of the line joining Yani Khediz and Sanjak Spits.

Lightbuoy.—A lightbuoy, cylindrical in shape, with framework superstructure painted in black and white horizontal bands, exhibiting a flashing white light every five seconds, is exhibited off Sanjak Spit.

Lightboats.—The channel northward of Yeni Kale is now marked by two small lightboats, each showing a flashing red light every three seconds. (See Light List.)

Vessels must pass between the lightboats.

Wrecks.—A sunken vessel lies about 800 yards 348° from Fort Yeni Kale Light. In February, 1899, she was lying in 16 feet water with a portion of the mast showing.

The wreck of the steamer *Nevada* lies sunk in Smyrna Harbor, 1,100 yards 33° 30′ from Fort Yeni Kale Light.

Digitized by Google

The wreck is marked by a lightbuoy, which must be kept to the northward.

Mines.—Mines (1914) have been placed in the gulf and vessels are prohibited from entering at night.

Pilots will guide vessels through the channel, about 220 yards wide, marked by the two large red buoys and an outer (western) buoy painted red and white. Near the outer red and white buoy a naval vessel is moored, which may be signaled by approaching vessels.

Kathura Spit is the name given to the flat eastward of Sanjak Spit, northward of the 5-fathom curve.

South shore.—Sanjak Kalessi on the southern shore, is 5¼ miles westward of Smyrna inner harbor. It is easily recognized by Yeni Kale Fort and by the lighthouse.

Shoal water under 5 fathoms extends 150 yards from the lighthouse.

Light.—From an iron staff on a dwelling near the extremity of Sanjak Kalessi are shown two fixed red lights placed vertically. The upper light is 49 feet above the sea and visible 6 miles. (See Light List.)

Clearing mark.—The shoal water extending from Sanjak Kalessi is cleared by keeping the remarkable sharp peak (eastward of Smyrna) open a little northward of Agios Joannis cupola bearing 81°. This mark leads also to the anchorage off the town.

Jackal Point is 2 miles eastward of Sanjak Kalessi, the coast line of the shallow bight between them forming a slight curve. There are some huts close to the extremity of the point.

Beacons.—On the northern side of the harbor, in a depth of 3 fathoms, at 1 mile northeastward of Sanjak Spit, a black beacon, with conical topmark and 14 feet high, has been erected. On the southern side of the harbor, in 3 fathoms, at a distance of 400 yards northward of Jackal Point, is a red beacon with spherical topmark.

Shoal water extends from Jackal Point ¼ mile, and may be cleared by keeping Kuklijah Cliff, 1,064 feet high, just northward of the southern end of the barracks 96°. The cliff is not easily distinguished, being backed by higher land, which prevents its being seen when the sun is behind it. The barrack is a long white building near the water.

Keos Tepeh Bay is the name given to an indentation 2 miles broad immediately eastward of Jackal Point. The suburb of Kalifatia is situated upon its eastern point.

From Kalifatia the shore of the suburbs and city of Smyrna extends nearly straight 2¼ miles to Daragaz Point, whence the coast turns to the east-southeastward for 1¼ miles, then north for 2 miles, form-

Digitized by Google

ing the head of the gulf. It then runs westward for 2½ miles to Cordaleo Point, already alluded to.

The depths gradually decrease to the head of the gulf.

Inner Harbor.—In front of the city is a well-constructed embankment of blocks of concrete, 1¼ miles in length and 60 feet wide, along the sea face of which there are from 2 to 4 fathoms water. At the southern end, near St. Peter's Castle, the customhouse pier, about 220 yards in length, projects northwestward, between which and the southern angle of the breakwater is a passage 130 feet wide. The breakwater then extends in a northerly direction about 450 yards and northeasterly 200 yards. From the corner of the embankment abreast the northern extremity of the breakwater a pier 160 yards long extends toward the latter, leaving a passage between them about 80 yards broad. This is the northern entrance of the inner harbor, which has an area of about 40 acres, and depth both in the entrances and in the harbor generally of about 33 to 36 feet; there is a depth of 15 to 18 feet alongside the quays. From the southern angle of the breakwater an arm extends in a southwest direction 340 yards.

Caution.—Entering the inner harbor by the southern entrance, the southwestern extremity of the breakwater must not be rounded too closely on account of some submerged steps.

Naval vessels.—The usual berth in the inner harbor for naval vessels is under the north pier, on the inner portion of which stand the port and health offices. Vessels lie parallel to this pier, with anchors ahead and stern hawsers to the quay.

The depth in the southern entrance is about 22 feet. Some mail steamers use it, and at their own risk, as the port authorities do not guarantee this depth.

Submarine mining.—A submarine mine field has been laid down in Smyrna Harbor in the vicinity of Fort Yeni Kale. Masters of vessels are warned that they must not anchor or stop in this part of the harbor.

Lights.—The northern entrance to the inner harbor is marked by a fixed red light on each side, shown from posts. These lights are only shown when mail steamers are expected. The eastern light is changed to green when a vessel has permission to enter.

Regulations.—To enter the inner, permission has to be obtained from the port authorities. When granted, an officer is sent on board to berth the vessel and a green flag is hoisted. A red flag is hoisted when a vessel is going out. Before scraping a vessel's bottom permission must be obtained from the port office.

Anchorage.—A good berth can be taken up in 8 to 10 fathoms from ½ to ¾ mile westward of the northern end of the breakwater.

Digitized by Google

Vessels are not allowed to anchor eastward of a line running 356° from the northern end of the breakwater. The Austrian Lloyds' and merchant steamers generally go into the inner harbor, where cargoes can be discharged and shipped alongside the wharf, where there is every convenience. The harbor fees are fairly heavy; naval vessels are free from charge.

Piers.—On the western side of Daragaz Point is a small pier belonging to the Smyrna Steam Flour Mills, and on the northern side the pier of the Smyrna-Aidin Railway, 600 yards long, with an arm 200 yards long, having a depth of 28 feet at its end. Vessels drawing 24 feet load alongside the arm of the latter.

Directions.—There is no difficulty in the navigation of Smyrna Gulf, the range marks being clearly distinguishable. Sailing vessels generally enter with a fair wind, and should endeavor to be at the entrance before noon so as to get the first of the sea breeze, which if strong will carry them to the anchorage. It is advisable to keep along the eastern side of Chustan or Long Island at the distance of 1 or 1½ miles, and when abreast of Kilsali Island to steer for the Two Brothers, and keep close along the southern shore, which is all steep-to.

To clear the shoal water bordering the low shore on the eastern side of the entrance to the gulf keep the flat hill westward of Port Iero in Mitylene bearing 334° open westward of Dava Burnu. The flat hill in range with this headland leads over the Merminji Rocks. Should the wind be from southwest, do not keep away too soon after passing Chustan Island, as it will draw off the hills from south and from southeast on nearing Sanjak Kalessi.

The peak of Mimas, seen between the two northern peaks of Chustan Island, bearing 304° leads southward of Fishery and Paleo Khediz Spits. In approaching Pelican Spit, which will probably be known by the discolored water, the light buoy will be the best guide, but a remarkable conical peak eastward of the city of Smyrna in range with the northern end of Sanjak Kalessi 79° leads southward of the spit.

When about 1 mile eastward of Pelican Spit Light buoy edge to the northward and steer to pass between the white painted light-buoys off Sanjak Kalessi. But mariners are cautioned that their vessels must pass between the two lightboats (before mentioned) moored northward of Fort Yeni Kale.

A vessel standing toward the flats extending from the northern shore should keep Mount Sipylus (which has a black appearance, from the trees on its summit) open eastward of Menimen Skala, bearing 36°, but should not stand farther northward than a distance of ¾ mile northeastward from the southeastern extremity of

Digitized by Google

Kathura Spit. The best time for leaving Smyrna in a sailing vessel is with the first of the land wind, about 1 o'clock in the morning.

At night.—In entering the gulf at night the position of a vessel will be known by the bearings of Merminji Light; a mid-channel course (about 154°) should be preserved, and in proceeding to the southward Cape Merminji red light should not be brought westward of a 353° 30′ bearing until 6 or 7 miles southward of it, so as to avoid the shoal water bordering the low eastern shore. When at the above distance from the light, a vessel may edge a little to the eastward, but Cape Merminji Light should not be brought westward of 345°. When the Pelican Spit Lightbuoy bears about 114° it will be nearly in range in the 3-fathom curve on Paleo Khediz Spit, and by bringing the lightbuoy to bear northward of 86°, Paleo Khediz Spit will be passed about ½ mile.

Pelican Spit Lightbuoy should be passed at the distance of ¼ mile, with Sanjak Kalessi Lights bearing 79°. When about 1 mile to the eastward of Pelican Spit Lightbuoy, edge to the northward and steer midway between the two white painted lightboats moored between Sanjak Kalessi and Sanjak Spit Lights, with Pelican Spit Lightbuoy astern, a course may then be steered to lead clear of the shoals on either side to the anchorage, when a berth may be taken as convenient, westward or northwestward of the breakwater, as before stated.

Smyrna.—The city of Smyrna (called by the Turks *Ismir*), at the head of the gulf, is built at the foot of Mount Pagus, on the summit of which are the walls of a ruined castle. Like most Turkish towns, it has an agreeable appearance from seaward, and contains some well-built houses, which belong principally to foreign merchants. The houses are chiefly of wood, with brown roofs without chimneys, but those belonging to the Christians are distinguished from those of the Turks by being built of stone, and the eaves of many of them almost meet across the street, which are narrow and dirty. The warehouses on the marina are whitewashed, and no house in the town is above one story high.

To its position Smyrna owes the rank it holds among the most important trading places in the world. The extent and safety of its roadstead and the facility of its communications with the interior have made it the general emporium of the Levant.

In the immediate neighborhood are the pretty villages of Bournabat, Bujah, and Sedikioi, where the country seats of the consuls and merchants are situated. In the evenings thousands of well-dressed people promenade the marina, listening to the bands, etc.

The suburbs have extended greatly during the last few years, the houses now fronting the shore to the southwestward as far as Kalifatia, and tramcars run from the railroad station at Daragaz Point along

Digitized by Google

the shore as far as Keos Tepeh, a village about 1 mile westward of Kalifatia.

On the northern shore of the harbor a large village has lately sprung up, named Cordaleo. It is considered a healthful resort and is much frequented by the inhabitants of Smyrna. There are several landing piers, some bathhouses, and a marine promenade.

The Frank and Greek quarter extends along the shore and contains many shops, warehouses, and coffeehouses. The Armenians occupy a more elevated position. The Turkish quarter comprises the whole of the upper part of the city and the western side of the hill. The Jewish quarter is between the Turkish and Armenian quarters. In a magnificent casino built by subscription are all the principal periodical publications of Europe. Among the many public buildings there is a Greek college and a theater.

Population.—The vilayet of Smyrna was reported to be about 2,500,000 in 1913; the chief town, Smyrna, about 350,000.

Trade.—The imports consist of alcohol, cotton and manufactured goods, leather, hides, iron, coal, coffee, sugar, petroleum, hardware, rice, silk, timber, etc. The principal exports are dried raisins, figs, cereals, grain, opium, valonia, liquorice, cotton, olive oil, tobacco, carpets, wool, emery, skins, fruits, and cattle.

Rainfall.—The average annual rainfall is 30 inches.

Quarantine.—Vessels arriving with a foul bill of health or unprovided with a bill of health are subject to quarantine, which is performed at Vourlah. Passengers are disembarked at the lazaretto on Clazomenæ Islet.

Climate.—The summer heat is very great, but is generally tempered by a fine westerly breeze named the "imbat," which continues from about 10 a. m. till sunset. Occasionally, however, hot winds blow from the south and parch the country. Persons should avoid sleeping on deck if the season is unhealthful, especially during a gentle breeze off the shore.

Winds.—The predominant winds are from north to east, the greatest force being from north-northeast. The sea breezes may be expected from May to September, alternating with the land wind at night. Winds from west to north are light and it frequently happens that while a westerly wind is blowing at about 10 miles westward an easterly wind prevails at the anchorage, with a calm between. Once every two or three years a heavy gale occurs, but lasts only a few hours. The mean sea level falls with a northerly gale and rises with a southerly gale.

Seamen's hospital.—The prevailing diseases are bronchitis, fever, ague, and diphtheria. Foreigners are admitted on the payment of a fee. There is also a seamen's rest or coffee house.

Digitized by Google

Water.—The facilities for watering at Smyrna are very good. There are several tank vessels carrying from 10 to 15 tons, each constantly employed, and as they obtain their supply from an artesian well near the health office vessels are quickly supplied with the quantity required. Water is also brought into Smyrna from Paradise by aqueducts and distributed by leaden pipes.

Good water can also be obtained from an outlet near the Smyrna-Kassala Railway Co.'s pier.

Repairs.—There is every facility for repairs of vessels and machinery. There is a 10-ton steam hammer, and castings can be made up to 2 tons. The Smyrna & Aidin Railway Co. at their wharf have a crane capable of lifting 10 tons. Thirty-inch cylinders can be cast and bored.

Patent slip.—There is also a patent slip with a lifting power of 500 tons, but no dry dock.

Coal.—There is every facility for coaling at Smyrna, only the best Cardiff being obtainable, of which there is usually about 7,000 tons in stock. About 75,000 tons of coal are imported annually. About 2,800 tons can be delivered, working day and night, by means of lighters and pontoons carrying about 100 tons each. To vessels not in the inner harbor, strong winds, which occasionally blow, stop all communication with the shore, and coaling is then difficult.

In recent years considerable preference has been shown for Turkish coal, i. e., coal from the mines of Heraclea and district, of which 77,440 tons were imported in 1908, as compared with 45,805 in 1906. Cheapness principally accounts for the preference shown to the native fuel, but the quality of the coal has steadily and greatly improved of late years.

Supplies are plentiful.

Pilots.—There is a pilot station in Smyrna. No persons other than those holding a certificate of qualification (written in Turkish, English, French, Greek, and Italian) from the Ottoman State have any authority to practice as pilots.

Pilot boats are usually to be found off Yani Khediz.

Consuls.—There are consuls for all the European powers in Smyrna. The United States is represented by a consul general, vice and deputy consul general, and deputy consul general.

Communication.—Steamers connect with Liverpool, Marseille, Trieste, Piræus, Alexandria, Syria, Constantinople, and Odessa. There is also frequent connection with Rhodes, Crete, and the principal Turkish ports and islands of the Aegean Sea.

Railroads.—The Smyrna & Aldin line of railroad runs from the station near Daragaz Point to Turbali, Ephesus, Aidin, Serakioi, Dinair, and Chevril, the whole distance being about 240 statute miles,

Digitized by Google

From Turbali a branch runs to Tireh and Udemis. The same company also works the Smyrna suburban lines to Bujah and Sedikioi.

The Smyrna & Kassaba Railroad runs to Manissa, Kassaba, Alascheir (Philadelphia), and Afium kara Hissar, a distance of about 300 miles. From Manissa a branch goes to Ak-hissar (Thyatira) and Soma. From Afium kara Hissar a branch runs to Eskishehr, connecting with the main line from Constantinople and Ismid to Angora. This same company also work the Smyrna suburban line to Bournabat. The railroad station of this company is near the center of Smyrna.

Telegraph.—There is telegraph communication with Constantinople, Malta, Alexandria, Cyprus, and consequently with all parts of the civilized world, including the principal islands of the archipelago.

Tides.—The tides and currents are irregular. At full and change it is high water on the shore in the Strait of Khios at 2 h.; at Chustan Island, 3 h.; at Smyrna, 5 h. 30 m. and sometimes 4 h.; this is owing to the sea breeze, which at times impels the current and increases its height. At Smyrna the sea level varies 3 or 3½ feet, but at Khios and places adjacent only 2 feet.

Cape Bianco.—Cape Bianco (ancient *Argennum* promontory), as its name implies, consists of white cliffs of moderate elevation, conspicuous from the southwestward, and in shape somewhat resembles the Bill of Portland, on the south coast of England. The southwestern face of the cape is bordered at a short distance by shoal water and its northern extremity is also bordered by a rocky shoal, which extends off nearly 400 yards. The distance, however, between the rocky shoal and Panaghia Islet westward of it is ¾ mile.

Anchorage.—There is anchorage southeastward of Cape Bianco in any convenient depth, sandy bottom, which is much frequented by vessels unable to get through Khios Strait during strong northerly winds. Vessels anchoring here should be prepared to get under way before a southerly wind sets in, and care should be taken to avoid the rocky patches before mentioned by choosing a berth in not less than 10 fathoms within ½ mile of the Wedge or southern extremity of the cape. If farther southeastward a vessel should not go inside the line joining the extreme points of the bay or within a depth of 16 fathoms.

From Cape Bianco the coast trends about southeastward 7 miles to Port Egrilar. The soundings off this part of the coast are irregular; shallow water will be found in places some distance from the shore, and it should be given a wide berth. In the bay which the coast forms southeastward of Cape Bianco are four small rocky patches having from 1 to 4 fathoms water on them; they each lie about 800

Digitized by Google

yards from the shore, and between the distances of a little less than 1 mile and 2 miles eastward of the Wedge, with deep water between them.

Port Egrilar.—Port Egrilar extends 2¼ miles in a 18° 30′ direction, and is 1 mile wide at the entrance, but narrows to half this distance within; inside the depths are from 15 to 6 fathoms water, mud bottom, but its shores are bordered all round by shallow water, especially near the head, where a large portion is nearly dry. Great caution is therefore necessary on entering to keep in mid-channel, as the soundings are not in sufficient detail and there are no good leading marks for avoiding the shoal banks, which, however, on a bright clear day are plainly indicated by the discoloration of the water.

The eastern point of entrance to the port is a white cliff, and the hill immediately over it is 146 feet high; on the western side, nearly ½ mile northward from the western entrance point, is a sharp peak 264 feet high.

Egrilar, chiefly composed of storehouses for dried currants, is near the head of the port, on the western shore, with a pier and custom-house. The land on either side is hilly, but at the upper part of the port it is low, dry in summer, but marshy in winter, when a stream runs into it. The town of Latzata, containing a population of about 15,000 is 1½ miles northward of the village, but hidden from the anchorage by a range of hills; a good road from Egrilar leads to it. The town of Latzata suffered greatly from an earthquake on April 3, 1881.

Port Mersin.—From Port Egrilar to Port Mersin the coast is nearly straight in a southeasterly direction for 3 miles, but it should not be approached too closely. Port Mersin (*Myrtle* Cove) is 1½ miles in length in a 333° 30′ direction, and from ½ to 1 mile in breadth, having from 12 to 6 fathoms water. It is fronted by three islands and sheltered from all winds except from 153° 30′ through the narrow entrance. The two inner islands are united by rocks to the shore on either side. A small islet lies nearly midway between these two islands and is connected to the western one by a bank of 3 fathoms. The passage into Port Mersin is between the little islet and the eastern island; it is 250 yards wide and 11 fathoms deep.

Tavates Island, the southernmost of the three, is distant from the island northwestward of it 700 yards with depths of 4 fathoms between, but in the middle there is a rocky shoal with less than 1 fathom water on it. Small vessels may pass between the islands, avoiding the rocky shoal, but the vessel passage is southward of Travates Island and eastward of the islet between the two inner islands.

A shoal, with rocks above water, extends 400 yards southward of Tavates Island, which should be given a fair berth in rounding.

Digitized by Google

Port Sikia (*Fig Tree*) is rather more than 3 miles southeastward of Port Mersin. The coast between is irregular, rugged, and steep-to. Midway there is a small bay, with a depth of 7 fathoms, open to the southwestward. Port Sikia extends in about 1 mile northeastward and is 700 yards wide, with two small arms at its head, where one or two little streams run into the sea. There are from 10 to 5 fathoms water in the middle of the port, but it is exposed to the southwest. There is, however, just within the entrance on the southeastern side, a well-sheltered inlet, with from 7 to 3 fathoms, suitable for small craft. The steep white cliffs on the northwestern side of the entrance mark the locality.

Kavaki Bay is 4 miles southeastward of Port Sikia, the coast between being irregular, but steep-to. Kavaki Bay runs in northward nearly 1¾ miles; it is nearly 1,400 yards wide at the entrance, converges within, is clear of danger, and carries from 55 fathoms in the entrance to 5 fathoms near the head.

Cape Koraka (ancient *Korykeion* promontory) is a high bold headland, the southern termination of Mount Korykos, which about 5½ miles inland rises 2,328 feet above the sea, the land about 1,400 yards within the cape being 1,280 feet high. Viewed from any direction seaward, the cape is a prominent object and the water is deep close to its base.

Sighajik Bay.—The western and northern shores of Sighajik Bay are irregular and form several little bays or coves. On the western side and 2 miles northward of Cape Koraka is Port Vromo, an inlet extending nearly 1 mile northwestward, having in the central part from 25 to 10 fathoms and deep water close to the shore. Coasting vessels occasionally enter the port.

About 3 miles to the northward of Port Vromo are some remarkable white marks on the coast.

On the north shore and about 2 miles eastward of the northwestern corner of the bay is Port Erekevi, an inlet nearly ½ mile in extent, 7 to 10 fathoms deep, with a sandy beach.

Sighajik Harbor, in the northeastern corner of Sighajik Bay, is about ¾ mile deep in a southeasterly direction, with from 6 to 8 fathoms over sand and mud; in the entrance the depths are 10 to 12 fathoms between Sighajik Island and the bold coast of the mainland to the northward.

Sighajik Island, on the southwestern side, is 400 yards in length, with Island Reef extending ¾ mile from its northwestern extremity. Kybleh Point, eastward of the island, and the southern entrance point of the harbor, in range with the southern side of Quarry Hill (about 200 feet high, somewhat like the frustum of a cone, distant 1 mile from the town in a southeasterly direction), bearing 114°, leads northward of the reef.

Digitized by Google

In the narrow channel between the island and Kybleh Point the depth is 12 to 15 feet, but nearly in the middle is a rocky shoal with as little as 3 feet water on it.

Directions—Anchorage.—Approaching the harbor from the southwestward, Cape Koraka, the western point of entrance to Sighajik Bay, although bold with deep water close-to, should be given a wide berth in a vessel under sail, to avoid the baffling winds frequently encountered in its vicinity. The harbor is not easily distinguished at a distance, but its position will be known by a deep valley about 2 miles westward of it, which appears like an opening in the land. From the southeastward a white patch near the summit of the hill on the western side of this valley is a good mark.

Having rounded Sighajik Island Reef with the mark given above, steer in about mid-channel; the anchorage is in about 8 fathoms, good holding ground, and well sheltered. During fine weather vessels may anchor outside the harbor in from 15 to 20 fathoms about 232° 30′ from Sighajik Island, when, should the wind blow hard from the southwest, the harbor will be under the lee.

Sighajik town, at the head of the harbor, is of some commercial importance, and from it supplies of beef, poultry, fruit, and water may be readily obtained. It is about 20 miles from Smyrna, with which city it is in frequent communication.

Sailing vessels bound to Smyrna, and unable in consequence of strong northerly winds to pass northward of Khios or to work through Khios Strait, frequently anchor in Sighajik Harbor and send their goods overland to that city.

Chelik Point, 2 miles to the southward of Sighajik Harbor, is bold and steep-to, the coast between being irregular, about 200 feet high, and with deep water about ¼ mile from it. On the plain at the rear of the ridge are the ruins of Teos.

Teos Bay, to the eastward of Chelik Point, has depths of from 5 to 10 fathoms, but in the middle of the entrance there is a shoal patch with a depth of 3 fathoms.

Malkiar Bay is separated from Teos Bay by a tongue of shallow rocky ground projecting southward from the shore upward of 1 mile, upon which are three islets. On the inner and largest of these are some ruins.

There is a depth of 5 to 10 fathoms in the bay, but it, as well as Teos Bay, is exposed to the southward.

Malkiar Head, the southern extremity of the bay, is conspicuous from its green cliffs. It is bordered by shallow water.

Palamo Islet, 1 mile to the southward of Malkiar Head, lies close to the shore and has some ruins on it.

Coast.—From Palamo Islet the coast trends 6 miles to the southward to Bolemo Islet, the eastern extremity of Sighajik Bay. At 5

Digitized by Google

miles from Palamo Islet is a bold projection, 190 feet high, and covered with ruins, named Ovraeo Kalessi. It is joined to the coast by a neck of land, on either side of which is a little bay. In the northern one small coasting vessels anchor off a sandy beach, in from 4 to 2 fathoms water.

Gulf of Skala Nuova.—Bolemo Islet (ancient *Makris*).—At the southern termination of the promontory forming the eastern side of Sighajik Bay is a bold and rocky islet. It fronts a little cove, and together with the point eastward of it, forms a small harbor, 3 fathoms deep. Rocky shoal ground extends about 200 yards from the south and west sides of the islet. On the shore at the head of the cove are some hot springs. At 3 miles within the land is 910 feet high, and 1¾ miles beyond is 1,345 feet above the sea.

Hypsili Islet, about ¼ mile in extent and 186 feet high, lies 1,100 yards 148° from the termination of the promontory. Some rocks above water lie close to the southern point of the islet. Between the islet and the main there are from 10 to 20 fathoms. A rock which shows lies about 400 yards off the eastern part of the islet, with 5 fathoms water between them and 8 fathoms close outside the reef.

Lebedos Bay is 10 miles across from Bolemo Islet to Cape Bugali, and is backed all round at a distance of from 3 to 4 miles by mountainous land, Mount Alewan over the eastern part being 2,490 feet high. The water all round is rather deep for anchoring, excepting within ½ mile of the shore, and it is completely open to the southward.

In the center of the head of the bay is a small round projection (once the islet of Xingi) united to the beach by a neck of sand, on which are some ruins, and on the adjoining shore are the ruins of ancient Lebedos, whence the bay derives its name.

At 2½ miles to the southeastward of Xingi the Malkeji River enters the sea through a small low delta. At ½ mile to seaward of the extremity of the delta is the little islet of Pondiko, with a depth of 18 fathoms between it and the shore. At 3½ miles to the southeastward of Pondiko is Cape Bugali, the end of a projecting tongue of land and the eastern extremity of Lebedos Bay.

Coast.—From Cape Bugali the coast as far as Ghiour Kioi Bay, a distance of 6 miles, is irregular, with small bays and points with ruins and a few villages.

Ghiour Kioi Bay (ancient *Klaros*).—In case of necessity during offshore winds a vessel may drop an anchor for temporary purposes in Ghiour Kioi Bay westward of the village, but close inshore, as the water is deep; there is no shelter from the southward. There is a good road from here to Smyrna through a fertile country, and the journey on horseback occupies about 8 hours.

Digitized by Google

From Ghiour Kioi Bay the coast curves round to the east and south for 5 miles to the Kuchuk Mendere. At first the coast is hilly and rocky; but the latter part is low, and within it is a large lagoon which communicates with the sea, with a plain behind it. The low shore is bordered by a bank which extends off about ½ mile, and the soundings are irregular.

Kuchuk Mendere (ancient *Caystrus*) is fronted by a bar and interrupted by fishing weirs. The stone embankments which once confined the river are in many places still visible, but the landmarks at the termination of the embankments are now at a considerable distance from the sea, and the space between them and the beach is an unwholesome marsh.

The land in the vicinity of the river's mouth is low and covered with rushes, but ¾ mile from the shore and the same distance southward of the river is a hill 750 feet high and a cultivated plain behind it. At about ½ mile off the shore there are from 10 to 18 fathoms water, muddy bottom.

Ruins of Ephesus.—At about 3 miles from the sea, on the southern bank of the river, are the extensive ruins of Ephesus, at one time the largest and most frequented city in Asia Minor, but now presenting little but scattered and mutilated remains of its ancient grandeur. Christianity was established in the city by St. Paul, and Ephesus became one of the seven churches of Asia. St. John resided here, and probably died here; his tomb is shown near the quarries on Mount Prion. A little way above the site of Ephesus is a bridge of seven arches, through which the river winds clearly and without impediment. The sides of the mountains are in some places very precipitous and in others scooped into hollows filled with large trees.

The population of the modern town is only about 400, and it is an unhealthful place, with few facilities.

Anchorage.—For the purpose of visiting the ruins of Ephesus temporary anchorage, in fine weather, will be found on the bank stretching off Kavo Mikron Taliane, a point 400 yards northwestward of the ruined bridge at the northern end of the low shore. The bridge should be brought to bear 64° distant about 1 mile, a square ruin (St. Paul's Prison) on a hill 375 feet high, about 109°, and the entrance to the Kuchuk Mendere and place of landing 128°, distant 1¾ miles. In coming to an anchor the lead should be kept going. This anchorage is considered preferrable to that of Skala Nuova. It is advisable to land on the northern side of the river and to cross it about ½ mile up, where it is 40 yards wide, in a ferryboat. It is about an hour's walk from the beach to St. Paul's Prison and an hour and a half to the center of the ruins near a large archway.

Digitized by Google

Communication.—Ephesus is connected by railroad with Smyrna and with a town called Dinair, 186 statute miles (by rail) eastward of Ephesus. It is also in connection with the European telegraphic system.

Skala Nuova or Kus Adasi town stands partly on level land and partly on the slope of a hill. It contains about 3,000 houses, 2,000 of which form the Turkish town upon the level and is inclosed within walls, the gates being regularly closed at sunset, when all Christians are excluded; the streets are illpaved and dirty. A mountain stream runs down the Greek quarter, over a bed of rock, and has a pretty effect. The population is about 12,000.

Communication.—Steamers of the Pantaleon, Samian, and Hagi Daoud companies call here twice a week from Smyrna and Mersina, and the Austrian Lloyd's steamers fortnightly from Trieste. There is telegraphic connection with the rest of the civilized world.

Kus Adasi or Bird Islet, having a square tower on it, lies about 200 yards from the point near the southwestern end of the town, with from 1 to 3 fathoms water between.

Light.—From a mast on a white house situated at the northwestern extremity of Kus Adasi is exhibited, at an elevation of 98 feet above the sea, a fixed white light, visible 8 miles.

Aspros Kavo, a remarkable projecting white cliff about 1,600 yards northeastward of Kus Adasi, is surrounded by rocky ground which extends off 400 yards, with less than 1 fathom water on its outer edge, and steep-to.

The anchorage is between Kus Adasi and the shoal ground off Aspros Kavo, in 15 to 16 fathoms, soft mud, and entirely open to the westward. It is exposed to all winds from the northward, round by west to southwest. Between these points during summer the sea breezes invariably blow, often with considerable strength, and almost always sending in a heavy swell, and although the holding ground is good it is not considered safe for large vessels. Coasters obtain some shelter under the lee of Kus Adasi. As the sea breezes alternate with the land winds, vessels under sail can leave the anchorage at night or early morning.

Dangers.—Petroma Reef.—Yalanghi Burnu is the name of the cliffy point 700 yards southwestward from Kus Adasi. Petroma Reef, with less than 1 fathom water on it in places, lies westward of this point, the outer part with a depth of 2½ fathoms bearing 271° distant nearly 1,200 yards from Yalanghi Burnu.

Xerata Kargan Adasi Reef.—Kargan Adasi is the name given to the islet 1.3 miles south-southwestward from Yalanghi Burnu. This islet is close to a point off which lies an extensive bank with from 7 to 13 feet water on it and 6 fathoms between it and the shore.

Digitized by Google

The outer extremity of Xerata Kargan Adasi Reef, with depth of 13 feet, lies ¾ mile 291° from the northern point of Kargan Adasi. There is a narrow passage, which may be taken by small coasters, inside both reefs. As these dangers are steep-to and the handlead of no use, this part of the coast should be given a wide berth.

Coast.—Aslan Burnu, a prominent point 1 mile to the southward of Kargan Adasi, is backed by a hill, but from thence for a distance of 6 miles the coast, which forms a bay, is low, the hills retiring to a distance of from 1 to 2 miles from the shore. There is, however, an isolated hill with the ruins of a fort on it at 2 miles from Aslan Burnu. At the end of the lowland the coast turns to the westward as far as St. Nikolo Point, being bold, rugged and steep-to, and thence to the southward for 2 miles to Cape Kanapitza maintaining generally the same character.

For continuation of the coast to the southward, see page 302 and previous pages.

Samsun Dagh (ancient *Mount Mykale*).—This elevated range of mountains extends east and west upward of 15 miles and rises suddenly from the low swampy land on the south to its lofty summits 3,459 feet to 4,130 feet above the sea and falls again on the north, where its base forms the southern shore of the Gulf of Skala Nuova. Upon the rocky slopes toward the southeastern termination of the mountain are the ruins of Priene (now called Samsun), on a bold and precipitous rock. They consist of walls covering an extensive slope of the hill, out of which, as if built by art, spring perpendicularly the rocks on which the Acropolis was built. Priene is said to have been originally on the seashore. The elevated mass of the Samsun Dagh terminates westward in Cape Kanapitza (ancient *Trogilium promontory*).

Panagia Islet, situated 700 yards 345° from St. Nikolo Point, is about 400 yards in extent and separated from the mainland by a channel 400 yards wide and 13 fathoms deep.

Samos.—This island, one of the principal of the Aegean Sea, is nearly 25 miles in length east and west and about 10½ miles in extreme breadth. The approaches to the island are clear of off-lying dangers, the shores are generally steep-to, and there are no rocks or shoals which may not be avoided by ordinary attention.

Aspect.—Samos is of a mountainous character, the two principal elevations being Mounts Kerki and Ampelos; the summit of the former at the western end being 4,725 feet above the sea, and the barren rocky peaks of white stone of which it is composed reflecting the rays of the sun, give the appearance of snow. This mountain is nearly entirely surrounded by precipices and is most difficult of approach. The ascent to Mount Kerki is varied and magnificent in the highest degree, the path at times winding through overhang-

Digitized by Google

ing forests of oak and plane trees interspersed with firs and tangled underwood; at other times running so close to the edge of the precipices as to raise doubts regarding the possibility of reaching the summit. As the summit is neared the scenery becomes barren and desolate in appearance. The only approach to the peak is by a narrow ridge of loose stones on the eastern side overlooking a ravine on either hand, nearly perpendicular, and where one false step would be fatal. Little or no vegetation appears on this sterile spot. The mountain forms three peaks about 250 yards apart; the western is about 6 feet higher than the others, the southern has a small chapel on it and was formerly used as a lookout house. The view from the top is extensive and highly interesting.

Mount Ampelos, of the eastern range, which rises near the middle of the island to the height of 3,730 feet, is round-topped and easy of access. The sides are well clothed with forest trees.

The general appearance of the northern side of the island is beautiful in the extreme, being broken into unconnected hills and ranges, clothed in most places with luxuriant vegetation and large trees; in other places rising to bare sterile peaks, splintered into numerous fantastic shapes, forming a strong and picturesque contrast to the dark foliage which clothes the higher ridges of the mountains behind them.

Produce.—The villages are numerous and scattered over the island, which contains an almost exclusively Greek population, amounting in 1902 to 53,424. The produce consists of wine, oil, silk, valonia, cotton, corn, onions, and honey. Iron, copper, and lead are also to be found and marble abounds. Pitch and tar were formerly made in great quantities in the mountains, but the forests are fast falling before the ax. Near the village of Platano, on the ridge of Mount Kerki, a kind of white clay is found which is used as a substitute for soap; red ocher is also found, and many kinds of grapes are grown.

Trade.—The principal imports are grain, flour, alcohol, sulphur, iron, cotton and woolen goods, wood, and hides. The principal exports are wine, tobacco, olive oil, and locust beans.

Communication.—There is frequent communication by various lines of steamers, and a post office is established.

Climate, etc.—The air is remarkably salubrious, and many of the inhabitants live to a great age. Possessing the greatest natural advantages, well stocked with oxen, sheep, poultry, game, fish, etc., and highly productive of every marketable commodity, this island should be the richest and best supplied in the archipelago, but it is not so. The men are a fine race, but indolent and improvident, with a natural proneness to pleasure.

Numerous streams in the interior contribute to the fertility of the soil. The Mitelinous River runs into the sea a little eastward of

Digitized by Google

Port Tigani, on the southeastern side of the island, and the Imbrasus about 3¼ miles westward of that port. Both are considerable streams in the winter, but in summer they are either dry or turned into different channels for the purpose of irrigation. Another and rather considerable stream rises at the foot of Mount Ampelos, and after winding among the hills and turning many mills in its way falls into Maratrokampo Bay.

Antiquities.—Many remains of antiquity are to be met with, but the most considerable are at Port Tigani, where the ruins of walls and the sunken mole attest the former grandeur of the city. A theater on the side of a hill is in tolerable preservation and numerous fragments of columns and capitals are strewn about the small plain. On the northeastern bank of the Imbrasus and near the sea once stood the temple of Juno, one of the most superb and ancient temples in Greece. Its length appears to have been 576 feet, with 24 columns on each face and 12 at each end; only one now remains, without a capital, which lies shattered near its base.

Government.—Samos is under the Turkish Government, but ruled by a phanariot Greek, with the title of Prince of Samos, and the people choose their own magistrates. They pay a tribute to the Porte, but are otherwise virtually independent. The former capital was Khora, about 2¼ miles northwestward of Tigani, an indifferent town or village with stony, steep, unpaved streets. The present capital is Vathi, to be again alluded to in connection with the port of that name.

Samos Strait.—The island of Samos is separated from the mainland by a strait about 1,800 yards wide at its narrowest part, where the islet of Panagia, 400 yards in extent, is situated, and a 5-fathom rocky shoal midway between the islet and Somos. With this exception, the strait is clear of danger at a prudent distance from the shore.

Anchorages.—There is excellent anchorage in any convenient depth with northerly winds all along the southeastern coast of Samos from Karavotra, the small rocky islet eastward of Cape Colonni, to Psili Point, including Tigani and Misocampo Bays. The best anchorage is perhaps in the latter, in 8 fathoms, sand and mud, near the center of the bay. The Mitelinous River, a small stream, here runs into the sea but it is turned off occasionally in the summer for the purpose of irrigation.

Karavotra, the small rocky islet 1.6 miles eastward of Cape Colonni, the southwestern entrance point of the strait, is ½ mile from the shore, which is bordered by shoal water, and 232° distant 600 yards from the central part of the islet is a rocky shoal with less than 1 fathom on it and 17 fathoms close-to.

Digitized by Google

Port Tigani is on the southeastern coast of Samos and affords room for a limited number of vessels. A breakwater about 500 yards long extends over the site of an ancient mole from the western point of the entrance, having a number of stone bollards, to which large steamers and other vessels secure their sterns while taking in or discharging their cargoes. In the inner port, situated in the northwestern corner, quays have been constructed, and there is a depth of 10 to 13 feet.

In the outer port, to which the breakwater affords some protection from southerly winds, there are depths of from 17 to 27 feet.

The port will be known by the conspicuous and picturesque monastery of Metamorphosa, standing over the coast on the western side. Much of the marble required to build it was taken from the old city; it was fortified but is now uninhabited and fast falling to decay, like many other interesting remains on the island.

Tigani is an indifferent village, having only a few good houses, with unpaved, narrow, stony streets scarcely passable.

Lights.—Forty yards back from Glykora Point, on the eastern side of entrance to Port Tigani, is a white house with a mast on it, from which, at an elevation of 65 feet above the sea, is shown a fixed white light, visible 10 miles.

A fixed red light, elevated 30 feet, is situated on the extremity of the breakwater.

A fixed green light is situated on the southern extremity of the mole, on the eastern side of the inner harbor. It is also elevated 30 feet.

Directions.—In proceeding through Samos Strait vessels may pass on either side of Panagia Islet, which is not high, but the northern passage is the wider and mostly preferred. Care must be taken to avoid the 5-fathom rock in the middle of the northern channel.

Current.—The current generally runs to the eastward and sometimes as fast as 3 to 4 knots; but southward of the islet, at times, it sets westward and varies in direction. During northerly winds the squalls in this strait are not so heavy as off the western end of Samos, and with the favorable current it is easy to work to windward.

Port Mollah Ibrahim.—In the small port of Mollah Ibrahim, near the southeastern end of Samos, the water is deep for anchoring, but the holding ground is good. The shore round the port abounds with wild liquorice. Græpodi Point, on the western side of entrance, should be given a berth of more than 200 yards. On this point and on Kukura Point, on the other side of the strait, are the foundations of two circular buildings which, from their positions, perhaps were formerly used as lighthouses.

Aspect.—The land over Mollah Ibrahim is 837 feet high, and when open eastward of Cape Prason, the northeastern point of Samos,

Digitized by Google

forms two peaks appearing from the northward like a saddle. These hills, rising close over the southeastern extremity of Samos, with the Samsun Dagh on the left, are conspicuous and form excellent marks for entering the strait from the northward.

Cape Prason, the northeastern extremity of Samos, is the termination of a high, rugged, bold, cliffy peninsula projecting 2¼ miles eastward from Mount Zodoki (1,228 feet high), called Dumuz Burnu.

At about 300 yards eastward of the cape is a rocky patch with 6 fathoms water on it.

Dascalio Point, 4 miles 288° 30′ from Cape Prason, is a bold projecting point, surrounded by five small islets which are steep-to on their seaward sides.

Port Vathi, on the northern side of the eastern part of Samos, is the principal port in the island. It runs in between high wooded land 2½ miles southeastward and from 1 mile in breadth at the entrance narrows within to about half this distance but widens again at its head. The water at the entrance is deep, but in the inner part of the port there are from 6 to 20 fathoms. Although a heavy swell sets in with northwesterly winds (the usual summer wind), the anchorage is good, the holding ground excellent, and with common precautions vessels never drive.

Ledge.—Monopetron Point is situated on the southwestern side of the port and 1¼ miles from its head; close to the point is a ledge awash.

Lights.—Two hundred yards back from the northern part of Kotzikas Point, the northeastern entrance point of Port Vathi, is a white house surmounted by a mast, from which, at a height of 131 feet above the sea, is exhibited a fixed white light, visible 12 miles. It is not seen inside the port when bearing northward of 46° 30′.

A fixed red light is exhibited from a mast at the extremity of the breakwater extending from Kachuni Point on the northeastern side of, and about ½ mile from, the head of the port; it is elevated 19 feet above the sea and visible 4 miles.

Anchorage.—The best berth is on the southwestern side, near a white house and garden, in 13 fathoms, mud, sheltered from the swell by Malagari Point, the low sandy point to the northwestward, on which are situated some conspicuous wine stores. Merchant vessels lie off the town in from 10 to 3 fathoms water, mud. A good berth for a large vessel is in 7 or 7½ fathoms with a conspicuous peak between two windmills bearing 120° and the health office open northward of the flagstaff. The water shoals rather suddenly from 7 to 5 fathoms, but more gradually from 5 to 2 fathoms.

Breakwater.—There is a breakwater 370 feet long at Kachuni Point.

Digitized by Google

There are three wooden piers for discharging cargo on the southern side of Malagari Point. Sand can be obtained on the southern side of the point.

Directions.—Bound for Port Vathi from the northward, bring Samsun Dagh to bear about 125° and steer for it. Port Vathi will be known by being the lowest land under the saddle between the two peaks of the mountain. There is no danger lying far off the shores of the port, excepting a small rocky shoal with 2¾ fathoms water on it in the bight about halfway in on the northeastern side, but it is rather out of the way of vessels unless beating in or out.

Caution.—The harbor is subject to heavy squalls from the hills.

The town of Vathi, at the head of the port, is the present capital town and largest in the island. Here are situated the palace of the Prince of Samos and the Government buildings. It has a quay along the entire sea front, with a depth of 6 feet alongside, and a well-made zigzag carriage road connects the town to upper Vathi. The town is well built, clean, possesses free schools and a free public hospital, and the sewage is being improved.

Supplies.—Small supplies may be obtained here, but no fuel.

Water.—Water is supplied by hose over the quay into lighters or vessel's boats.

Communication.—There is telegraphic communication with Europe and the principal ports of Turkey, and telephonic communication with the principal villages in the island. There is frequent steamer communication with Marseille, Trieste, Smyrna, Piræus, Constantinople, Crete, and the Syrian and Egyptian coasts; also with the neighboring islands.

Karlovassi.—A harbor with two breakwaters has been constructed at Pankosi Point, near Karlovassi, on the north coast of Samos, 12 miles to the westward of Port Vathi. The eastern breakwater runs 333° 30′ for 300 yards. The western breakwater, starting 430 yards to the westward, runs 13°, 250 yards and then 63° 30′, 250 yards, leaving an entrance 130 yards wide. The general depth in the harbor is 16 feet and alongside the quay, between the breakwaters, 10 feet.

Light.—A fixed red light is shown, at an elevation of 33 feet, from an iron framework on the end of the west pier; it is visible 3 miles.

Communication.—Steamers of the Pantaleon Co. call at Karlovassi Harbor once a week from Smyrna and Rhodes. The town of Karlovassi, about 1 mile distant, is a telegraph station.

Port Zeitani, or Devils Harbor, is a small harbor formed by some rocks about 2½ miles to the southwestward of Karlovassi Harbor, but is exposed and seldom used.

Cape Katabasis, the western extremity of Samos, is bold and steep-to, the 100-fathom curve being only 400 yards distant.

Digitized by Google

Cape Dominiko, the southwest point, is also bold and steep-to. This portion of the coast is very broken, but with no dangers outside its numerous small bays.

Maratrokampo Bay.—Small vessels sometimes anchor in Maratrokampo Bay, east of Cape Dominiko; but it is necessary to be close inshore, as the water is deep and the shore bank is very steep. The best berth is in 4 or 5 fathoms, sand, and 700 yards from the shore, with the houses on the beach in range with the village of Maratrokampo on the hill. The squalls from the mountains are very violent during northerly winds, and therefore the anchorage is not recommended; even in moderate northerly winds the squalls sweeping down the hillside are highly dangerous, and many small vessels are annually upset or dismantled in this vicinity.

Harbor.—A small harbor with a depth of about 13 feet has been constructed. It is formed by two breakwaters about 80 and 300 yards long respectively.

Water may be procured here from an aqueduct, which, however, is sometimes dry.

Samo Pulo Islet, off the eastern point of Maratrokampo Bay and 2½ miles westward of Cape Colonni, is about 1 mile in length and 800 yards from the shore. Its northern and northwestern points are foul, there being a rock with less than 1 fathom water over it lying 200 yards northward of North Point and a rock awash 600 yards 294° from the northern entrance point of the little bay on the western side of the islet. Midway between the islet and Samos there are from 20 to 25 fathoms water. The mainland within rises from the bold shore to a mountain called Prophetes Elias, 2,455 feet high.

Nikaria.—This island (ancient *Ikaria*) is about 22 miles in length 63° 30′ and 243° 30′ and from about 3 to nearly 5 miles in breadth. A chain of lofty mountains occupies its entire length, varying in height from 2,000 to 3,420 feet. The chief town, consisting of a number of villages under the general name of Mesaria, is situated in the center of the island and contains about 200 houses, near which there are some remains of antiquity as well as in other parts. The inhabitants, amounting to about 12,800, maintain themselves chiefly by the sale of charcoal and firewood, gathered from the thickly wooded hills, to the neighboring islanders and to the towns on the coast of Asia Minor. Like the neighboring islanders, they pay an annual tribute to the Pasha of Rhodes.

Climate.—Nikaria has the character of being particularly healthful and conducive to longevity.

Productions.—Black raisins and fruits of all kinds grow luxuriantly here; the potatoes also are celebrated.

Communication.—Connection is maintained with Samos and Skala Nuova by caique.

Digitized by Google

Temporary anchorages.—There is no port in Nikaria, but on the north coast Greek coasting vessels anchor under Kavo Agio Phokas, 3 miles westward of Cape Phanar; also in Kerame Bay at about the center of the north coast, with offshore winds and under favorable circumstances, but this part of the coast should be quitted at the least indication of a northerly wind. Temporary anchorage may also be found in places along the southern coast of the island with offshore winds, such as Agios Georgios ½ mile southward of Cape Phanar; Kriphoghialia or Angeriko Bay, 6 miles southwest of the same cape; and at Nikolaos Bay, 3 miles eastward from Cape Papas, but there is no shelter whatever from southerly winds.

In 1909 the British naval vessel Bacchante anchored in Armenisti Bay, 1,100 yards 338° from Yediskari Island (6 feet high), in 17 fathoms. From this position the water shoaled very gradually toward the shore, the 10-fathom curve being 700 yards from the vessel.

Cape Phanar and Beacon Hill.—At about ¾ mile southwestward of Cape Phanar, the eastern and somewhat flat extremity of the island, is a small elevation called Beacon Hill, and 800 yards nearer the cape is a ruined tower about 40 feet high. Southward of Beacon Hill is a curved sandy beach, off which a vessel will find shelter during a northerly or westerly gale. The shore northward of the beach is bordered by patches with 5 fathoms water on them, at a distance of about 400 yards, which should be given a fair berth in a large vessel.

There are no off-lying dangers round the island, but sailing vessels should be cautious when near the highland and guard against squalls.

Nikaria Passage, between the island and Themina to the southeastward, is 4¾ miles wide, clear and deep.

Cape Papas is the name given to the southwestern extremity of Nikaria Island, which falls steeply to the sea. The cape takes its name from a pope who formerly dwelt on the island.

Light.—From a lighthouse on the extremity of Cape Papas, at an elevation of 213 feet above the sea, a flashing white light is exhibited, visible 25 miles.

Digitized by Google

Digitized by Google

CHAPTER VIII.

THE COAST FROM CAPE HYDRA TO THE KARA SU RIVER, WITH THE ADJACENT SPORADES ISLANDS.

For Psara and Khios Islands and the entrance to the Gulf of Smyrna, see page 305.

The Gulf of Sandarli or Chandarli (ancient *Cumæus Sinus*) extends eastward upward of 13 miles from the line joining Cape Hydra on the south and Cape Mal-tepeh on the north, which are nearly 13 miles apart. Its shores are irregular, broken with bays and indentations, and bold headlands, with low marshy ground. The town from which the gulf derives its name is on a peninsula on the northern shore.

The gulf is liable to strong and sudden changes of wind. The most prevalent are the "meltems" or northerly winds, which come on suddenly and blow hard, but generally give warning, as previous to these gales the summit of Mount Karadagh, on the northern shore, is covered with dense masses of vapor. At other times during the summer months the sea and land breezes are tolerably regular.

Cape Chemali (*Sekertzek*).—Between Cape Hydra and Cape Chemali, 4 miles eastward, the coast is bold, irregular, and steep-to. At nearly 1 mile from Cape Hydra and close inshore is the little islet of Sera, and between it and the shore are sunken rocks. At 1,400 yards eastward of the islet is Chanakia Liman, an inlet about 1,400 yards deep and ¼ mile wide, with from 22 fathoms water at the entrance to 5 fathoms near the head, and open to the northeastward. A shoal extends 200 yards northward from Cape Chemali, and about 1¼ miles southeastward of it is the bay of Foggia Nova.

Foggia Nova.—The bay of Foggia Nova or Naes Foyes is about 1,200 yards deep and nearly the same in breadth, though its entrance is narrowed to about 800 yards.

The bay is open to the northward, but as there is not much fetch and the holding ground good, there is no danger in anchoring here. When entering keep at a moderate distance from the eastern shore and anchor in 8 or 9 fathoms water, about 800 yards from the town at the head of the bay, bottom mud and weed.

Shoal.—A shoal named Xero Punda, with only 1 foot of water on it, lies about 400 yards northeastward of the western entrance point, and thence to Aspro Kavo, at ½ mile northwestward of the point, the

Digitized by Google

coast is fronted by shoal water, which also borders the shore of Foggia Nova Bay all round, to a distance of about 400 yards.

Supplies.—Small quantities of water and refreshments may be procured.

Namurt Liman.—At nearly 5 miles northeastward of Cape Chemali is Cape Utch-keucheh, the termination of a bold cliffy tongue of land with a sunken rock off it, which is steep-to. The cape should be given a berth of 400 yards. Between the two capes the coast forms a deep bight, at the head of which a projecting point with three little islets or rocks on its western side connected to the shore by shallow ground separates two bays, that to the northeastward being Namurt Liman. The shore of this bay is bordered all round by shallow water and rocks, and within the shore at its head is a farm and the ruins of ancient *Cyme*.

Port Ali-agha.—The coast from Cape Utch-keucheh to Tasli Burnu, 2½ miles eastward, is irregular, of cliff and beach, and bordered by shallow water and rocks.

Port Ali-agha is nearly circular, 1.7 miles in diameter, open to the north, with an entrance about ¾ mile wide. The southern and eastern shores are bordered by shallow water, and at the head of the port the 3-fathom patches extend off more than ½ mile, but the anchorage is spacious, in from 14 to 5 fathoms water, sand and mud, and good holding ground. There is no fresh water, and nothing in the shape of supplies can be obtained.

Tasli Burnu, on the western side of entrance to Port Ali-agha, is a sharp projecting rocky point with shoal water around it to a distance of 250 yards.

Tuzla Burnu, the eastern entrance point, is low and marshy with salt pans and a fishery backwater, and is also bordered by shallow water.

Agios Ioannis Islet, surrounded by shallow sunken rocks, lies in the southwest corner of the port, and on it is a conspicuous house.

Coast.—The shore between Ali-agha and Bektasat Sakan, about 4 miles northeastward of the former, is irregular and skirted by rocks which extend offshore to a distance of 300 yards in places. At 1 mile from Ali-agha is the outlet of the Guzel Assar Chai, on the west side of Mount Deirmi, from the base of which and the delta of the river shoal water extends northward nearly ¼ mile, and is steep-to. Mount Deirmi is a remarkable conical hill close to the sea.

Bektasat Sakan, also called Port Glymi, is a large expanse of water extending over a space of 2½ miles northeastward and southwestward by 1¼ miles. The greater portion of it is shallow and under a depth of 3 fathoms, but the central part is 3½ to 4 fathoms deep. The shallow water extends across the entrance from point to

Digitized by Google

point, which are 1.3 miles apart, and between them are the two little Sakran Adalari Islets united by a reef; northeastward of the islets the depth over the shallow ground is only 3 feet. The deepest water into the port is about 7½ feet and nearly midway between the southwestern point and the islets.

Rema Bay.—This bay is in the northeastern corner of the gulf, and the inner part of it is very shallow. The anchorage for small vessels is southwestward of the customhouse pier, in 5 or 6 fathoms, mud. Elæa, the ancient port of *Pergamos*, within the head of the bay, was once a port of considerable importance, but now, owing to the recession of the sea, it can not be approached. Among the ruins scattered about are the remains of an ancient mole. The bay abounds in flatfish, and particularly stingrays, which are dangerous to handle and inflict most painful wounds, difficult to cure. Mount Sakarkeya, on the eastern side of the bay, is 1,240 feet high.

Sandarli.—Between Rema Bay and Sandarli Harbor, nearly 5 miles westward, the shore is low, flat, marshy, and bordered by shallow water to a distance of ¼ mile. The Bakir Chai (ancient *Kaikos*) runs into the sea about 2 miles east of Sandarli. Sandarli Harbor is a little bay 10 to 6 fathoms deep, on the eastern side of a tongue of land on which is situated the town of Sandarli. An islet, called Eski Adasi, lies in the entrance of the harbor and should be left on the starboard hand in entering; the eastern passage is narrow and only 5 fathoms deep. A shoal extends off about 100 yards from the northern end of Eski Adasi. There is nothing to be obtained here.

Plati and Adelphi Islets.—In the entrance to the gulf are five small barren islets, which, with the exception of the Adelphi, are steep-to. The Adelphi, the two northernmost islets, are close together and surrounded by a rocky shoal which extends ¼ mile westward, where there are 4 fathoms water; the east end of the northeastern islet is steep-to.

Agios Georgios Islands.—These four islands or islets, the largest being rather more than 1 mile in length in a northwesterly and southeasterly direction, front the coast southeastward of Cape Mal-tepeh. Kormen Adasi, the southern islet, is wedge-shaped, with the thick end to the southward, and 40 fathoms water close to it, but a depth of 4 fathoms extends about 400 yards to the westward of the northern point. Tzorzi Kalessi, the next and largest, has a conspicuous old tower on it. On its western side is a bay with a little islet connected with the shore by shoal ground, and rocks skirt the shore north of the bay. A shoal with 2¾ fathoms water on it extends off 200 yards, a little eastward of its northeastern elbow.

Digitized by Google

Eki Kardarslar, the two northern islets, are small and close together, with shoal water around them. The Agios Beorgios Islands extend over a distance of 2.7 miles, with deep water midway in the channels between them.

Coast.—From Sandarli to Chinarli Burnu, a distance of 4 miles, is broken and irregular, but shoal water nowhere extends more than 400 yards from the shore. Chinarli Burnu is also bordered by shallow water, which is steep-to. The coast of Chinarin Burnu, 2 miles to the northwestward, is skirted by rocks and shallow water extending off nearly 400 yards, between which and the shoal water of Eki Kardarslar the passage is about 700 yards wide and from 19 to 30 fathoms deep.

Cape Mal-tepeh (ancient *Cana* promontory) is a bold headland and the western termination of Mount Karadagh, which is about 3 miles inland and 2,560 feet high. The shore of the cape is skirted by rocks to a short distance seaward. (For continuation of this coast, see p. 363.)

Mityleni (pronounced Mitilini).—This island is 38 miles in length in a west-northwest and east-southeast direction and 24½ miles nearly in extreme breadth. It is mountainous throughout and some of the hills are well wooded. The greatest elevations are Mount Olympus, 3,080 feet above the sea, in the southeastern part; Mount Lepethymnus, 2,752 feet high, in the northern part; and Mount Ordymnos, 1,780 feet high, near the west end.

Population—Trade.—In 1913 Mityleni was reported to have a population of 500,000. The trade products consisted of olive oil, soap, gums, sponges, oranges and lemons, cereals, hides, and skins.

Rainfall.—The rainfall during the year 1912 averaged 29.02 inches.

The island is considered very healthful, the only exception being during the autumn, in the marshy districts northwestward of Port Iero and northward of Port Kalloni, at which season malarial fever is prevalent.

Mityleni town, the capital of the island, is on the eastern coast about 6 miles from its southeastern extremity, on a small peninsula which forms a little port on either side. Of these, North Port is the more commodious, with from 5 to 2 fathoms water, partly sheltered by the remains of a pier projecting northwestward from the angle of the citadel; it is frequented by the larger vessels that visit Mityleni. South Port, from 3 to 1½ fathoms deep, is the best harbor for small coasters and the more frequented; the entrance is between two old mole heads, on each of which is a white house with a red roof and mast.

The town itself presents a most thriving appearance from the sea and is clean and well built. The hillsides for some distance around are covered with villas and orchards.

Digitized by Google

Lights.—On the point near the citadel, between the two ports of Mityleni, is a white house with a mast on it, from which is exhibited, at an elevation of 99 feet above the sea, a fixed red light, visible 6 miles.

Also, at South Port, a fixed red light is shown from each mole head at an elevation of 23 feet above the sea, visible 6 miles.

The anchorage off the town is in about 10 fathoms, sand and weed, with the entrance or lights of South Port bearing about 288° 30′ or 300°, and the light on the extremity of the peninsula bearing 1° 30′, or if necessary farther out.

This anchorage and Kabakum Bay, on the mainland opposite, are good stopping places, according as the wind is westward or eastward of south, when unable in a sailing vessel to work up the Gulf of Smyrna.

Shoal.—A patch with 4½ fathoms over it lies 134 yards eastward from the lighthouse near the citadel.

Communication.—There is telegraphic communication between Mityleni and the rest of the world, also good postal arrangements, there being frequent steamers belonging to various companies to Constantinople and Smyrna; also occasional connection with Saloniki and the ports of Mityleni Island. The Khedivial steamers call here weekly between Alexandria and Constantinople. A good road leads from the town to Port Iero.

Consul.—The United States is represented by a consular agent.

Supplies can be obtained at the town of Mityleni at moderate prices.

Coal.—About 3,500 tons of Heraclea coal are imported annually, 1,500 tons being usually in stock. It is put on board in lighters, each carrying 30 tons. Working night and day, about 800 tons can be put on board in 24 hours.

Cape Zeitin (ancient *Malea*).—The coast between the town of Mityleni and Cape Zeitin, the southeastern extremity of the island, is bold, and Mount St. Marino rises over it 1,740 feet high. At about ½ mile from the shore there are from 12 to 20 fathoms water.

Shoals.—Off Cape Zeitin a shoal, with 3 fathoms water on it, extends 300 yards southward from the shore, and should be given a wide berth. A large rock rises from the shoal close in, and 1,300 yards westward of it is another, named Simblo, or Beehive. The entrance to Port Iero is about 2½ miles westward of the cape, and will easily be recognized.

Port Iero or Olivieri is a fine landlocked basin of water, 4 miles long in a north-northwest and south-southeast direction, 2½ miles broad, with depths of 7 to 10 fathoms, mud bottom, and affords well-sheltered accommodation, with good holding ground, for a considerable number of large vessels. It is surrounded by hills covered with olive trees and backed by mountainous land.

Digitized by Google

The entrance to the port is through a narrow channel with depths of from 6 to 17 fathoms, about 3½ miles long and in some parts not more than 200 yards broad. The outer entrance of this channel, which is about 800 yards wide, may be recognized from seaward by White Crag Hill, 60 feet high (on the western side of the channel), with a small building a short distance southwest of it, and by the island of Prophylaki, to the southward.

Foul Point, on the southern side of the outer entrance, has a detached cliff near its extreme point, by which it may be distinguished, and terminates in a shingle beach, with a reef extending 200 yards in a northerly direction.

Mid Rock, about 500 yards northward of Foul Point, is small and black, with a smooth top, and about 6 feet high. It is not easy to recognize from seaward, being the same color as the background.

Reef Rock, about 15 feet high and of a light-brown color, lies on the extremity of a narrow spit extending nearly 400 yards in a southeasterly direction from the point at the foot of White Crag Hill.

Square Rock, on the western side of the channel ½ mile northward of Reef Rock, has a shoal extending from its southeastern side. At the extremity of this shoal, 75 yards 120° from the rock, there is a depth of 3½ fathoms, with 6 fathoms close-to.

A rocky ledge extends 50 yards from the point on the eastern side of the channel, 400 yards northward of Reef Rock. A white house near the eastern shore 1,200 yards northward of Square Rock, in range with the eastern side of Square Rock, bearing 345°, leads close outside this ledge.

The channel in this part is also contracted by a shoal that extends some distance from the point on the shore northeastward of Square Rock; from the most salient point of this shoal Entrance House (ruin) appears just open northward of Square Rock bearing 221°.

Northward of Square Rock the channel widens and is fairly straight for a distance of 2 miles to abreast Perama Skala village, on the western side of the channel. Off Perama Skala and in the bay opposite there is sufficient space and depth for several vessels of the heaviest draft to moor.

From Perama Skala into Port Iero the deep-water channel, in which there are depths of 5 to 8 fathoms, lies near the eastern shore; the narrowest part of this channel is only 100 yards broad.

A long continuation of southerly winds is said to increase the depth of water from 1 to 2 feet, and northerly winds to decrease the depth the same amount.

Caution.—No vessel drawing more than 24 feet water should attempt this passage without previously sounding and buoying it.

Directions.—In fine weather and during daylight steamers may steer with confidence for Port Iero. White Crag Hill and Prophylaki

Digitized by Google

Island can not be mistaken; Reef Rock will also show as the entrance is neared.

White Crag Hill, bearing 294°, and just open northward of Reef Rock, leads in 17 to 19 fathoms between Mid Rock and the reef extending from Foul Point.

After passing Mid Rock, open Reef Rock on the port bow and steer in mid-channel, altering course gradually to the northward until Square Rock opens on the port bow. Mount Lutro bearing 342°, in range with the white house in the bay 1,200 yards northward of Square Rock (already mentioned), just clears the shoal off the latter in 5 fathoms; Mount Lutro should consequently be kept just open to the eastward of the house in passing the rock.

After rounding the shoal, keep in mid-channel as far as Perama Skala. The narrow channel northward of this village should not be attempted in a large vessel without local knowledge or without being buoyed.

Sidero Island, which lies about 150 yards from the eastern point of the northwestern entrance of this channel, may be passed at a distance of 100 yards to the westward.

Anchorage.—The best anchorage is in the northwestern part of the bay, about ½ mile southward of the hot baths, in 6 fathoms of water, mud.

Caution.—Vessels can not enter or leave Port Iero at night or in thick weather with safety; it would also be hazardous for vessels of heavy draft to attempt to enter the port in a southerly gale.

Telegraph.—There is a good road from Port Iero to the town of Mityleni, a distance of 2½ miles, whence telegrams may be sent to any part of the world.

Water.—There are several streams running into Port Ieto from which fresh water can be obtained, but as they nearly all run through marshes, it would not be advisable to use the water except for cooking or washing. A specimen of water obtained from the clearest stream was analyzed in the summer of 1877 and found to be sufficiently pure and safe for all domestic purposes; some water from a warm spring was also analyzed, but was not deemed fit for drinking or culinary purposes.

Supplies.—There are some small villages near the shores of port Iero, where supplies of beef, vegetables, and bread of good quality can be obtained.

Coast.—The little islet of Prophylaki lies 1,200 yards from the shore on the western side of entrance to Port Iero and has deep water all around it. At 1¼ miles westward of Prophylaki is a small bay named Petras, with two little islets in front of it. From Petras Bay the south coast of Mityleni trends westward 5½ miles to Meriko Point and then more northerly for 11 miles to Cape Vurkos. Meriko

Digitized by Google

Point is slightly salient, and the shore east and west of it is bordered by shallow water to a distance of about ¼ mile.

Potamos Point, 3½ miles westward of Meriko Point, has some rocks at its base above water and a shoal extending off nearly 400 yards; between Potamos Point and Cape Vurkos the shore is also bordered by shallow ground.

Telegraph.—At 1½ miles to the westward of Meriko Point is the village of Polamos, from which a road about 1¾ miles long leads to the village of Plumari, a telegraph station.

Cape Vurkos is a projecting point, and at 700 yards within its extremity is a church; close-to is a rock above water, and a chain of sunken rocks extends ½ mile southeastward of the cape, the outer of which with less than 1 fathom water on it, is called the Falcon. These dangers are steep-to, and the cape should be given a wide berth.

Khoklakari Bay, on the eastern side of Cape Vurkos, affords temporary anchorage during offshore winds, but it is exposed to the southward and winds from that quarter send in a heavy sea.

Port Kalloni.—The entrance to this port, formerly called Port Longone, is 6 miles northwestward of Cape Vurkos. The port is a beautiful sheet of water, extending into the island 11½ miles in a northeasterly direction and in the inner part 4 miles wide, with from 4 to 10 fathoms water, muddy bottom. On the eastern side of the entrance is a cliffy cape and an islet, both named Kalloni, with a passage a little more than 100 yards wide and 4 fathoms deep between the shoals bordering the two.

The ship passage northwestward of Kalloni Islet (Barbia) is contracted by an extensive rocky bank named Plati, stretching from the western shore and covering the entrance of the port, but leaving a narrow channel ½ mile in length and about 70 yards wide, in which the depths are from 14 to 18 fathoms water.

Off the point on the southern side of the channel, 1,300 yards above Kalloni Island, rocks which show above water extend for 30 yards and shoal water of less than 3 fathoms for about 100 yards.

Within the Plati Bank is a large open space called Agia Pandelemona Bay; it is about 1 mile in length, 10 to 14 fathoms deep, with Erimo Nisi surrounded by rocks in the northern part. The passage, 400 yards wide, into Port Kalloni is at the eastern end of the bay, and between the shoals extending from the points on either side there are from 10 to 15 fathoms water. The port is frequented by coasters, and a small steamer from Smyrna calls twice a week. It is subject to heavy squalls from the high land surrounding it.

Anchorage may be obtained in Apothero Bay, about 400 yards northward of Erimo Nisi; here there is a village, with a small boat pier and customhouse.

Digitized by Google

Supplies.—Good beef and vegatables at moderate rates can be obtained, but no bread.

Coast.—From Port Kalloni the coast trends westward 5¾ miles to Cape Brisa, a prominent cliffy point with shallow ground around and a rock above water off it. At ½ mile eastward of the cape is a bank of sunken rocks nearly ¼ mile from the shore. These dangers are steep-to, and the cape should be given a wide berth. From Cape Brisa the coast trends northwestward 7¾ miles to Cape Sigri, the western extremity of Mityleni; it is throughout irregular, cliffy, with some beaches, backed by highland, and has deep water at ¼ mile off.

Cape Sigri is a steep, irregular, cliffy projection 200 feet high, and conspicuous from the southward by its abrupt termination; but from the westward it becomes blended with the highland and is not then readily distinguished, but the cliffs of Sigri Island, showing white, form a good mark. The little islet of Sidusa, 180 feet high, is also remarkable from its conical form. Cape Sigri itself has been undermined by the sea, and the débris from the cliff falling seaward has formed a rocky ledge. Off the cape is a rock 8 feet high joined to the shore by a ledge just covered. Mount Ordymnos, 1,780 feet high, on the summit of which is a monastery, is a good distant mark. From the southward the mount has a peaked appearance, which disappears when seen from the northward. From the north-northeast the western side of Mityleni appears to slope gradually down to the water's edge, and the lighthouse on Sigri Island, when visible, is a conspicuous object at a good distance.

Temporary anchorages.—During strong northeasterly winds vessels will find anchorage off a sandy beach at about 2¼ miles southeastward from Cape Sigri, in about 14 fathoms, but no farther out; at 150 yards outside this depth there will be 20 fathoms. Fresh water can be obtained from a small river at the eastern end of the beach. There is also good anchorage in from 7 to 10 fathoms water in Brisa Bay, about 6 miles southeastward from Cape Sigri; it will be known by a fine beach having a little islet off its eastern end and a valley with several olive groves and a few houses. This is the best anchorage in the vicinity, but vessels at anchor in either of these bays should leave immediately a gale abates.

Sigri Island, 1 mile northward of the cape of this name, is 1½ miles in length north and south, ¼ mile wide, and 200 feet high at 1,200 yards from the southern end. Its sea face is cliffy, irregular, and bordered by shallow water and rocks, which extend off about 300 yards, and at 700 yards northward of the lighthouse and 400 yards from the shore is a 5-fathom patch.

Light.—A flashing white light is shown, at an elevation of 180 feet, from a white iron tower 65 feet high on the western extremity of Sigri Island; it is visible 20 miles, but within 10 miles the eclipses

Digitized by Google

are not total, and it is partly obscured from seaward by the land. (See Light List.)

Sidusa Islet.—Fronting the entrance to Port Sigri and about ¾ mile from the southern end of Sigri Island is Sidusa, a conical islet 180 feet high, 400 yards in extent, and surrounded by rocks above and below water.

Ledges.—A rocky ledge extends from Sidusa islet 600 yards northward, on the outer end of which is a rock 2 feet high; another ledge, with large rocks 5 to 10 feet high on it, projects about the same distance southeastward. The extremity of the shoal is clearly visible.

Between the 5-fathom curve surrounding Cape Sigri and Sidusa Islet the passage is 800 yards wide. Between Sidusa Islet and Sigri Island the width of the channel between the same contour curve is 900 yards.

Port Sigri.—Sigri Island forms together with a bay in the coast a convenient and spacious port with from 15 to 7 fathoms water, mud, or mud and weed. The northern end of Sigri Island is less than 400 yards from the cliffs of the coast, and between the shoals extending from either side is a narrow passage carrying 2½ fathoms water into the port. The shore on the Mityleni side of the port is bordered by shallow water, and on a projecting point of the coast is the village and fort of Sigri. The anchorage is with the fort bearing about 108° 30′ in 12 to 14 fathoms, or farther northward in 7 to 9 fathoms, sheltered from nearly all winds. The bottom is reported to be good holding ground, but vessels with light anchors are liable to drag unless in muddy bottom.

The port is a place of refuge for vessels bound to or from Constantinople with contrary winds. During the warm season there is nearly always a fresh northeasterly wind, rendering the climate most enjoyable.

The village of Sigri consists of a cluster of small houses and a mosque. The streets are irregular and paved with cobbles. The inhabitants are all Mohammedans, but the majority speak Greek. There is a small stone pier near the fort.

Phanæ Islet.—A small islet surrounded by shoal water, named Phanæ, 30 feet high, lies close to the shore at the eastern side of entrance, with about 10 feet water between it and Mityleni.

Caution.—The soundings in the survey from which the chart of port Sigri is taken not being in sufficient detail, caution must be used in approaching its shores.

Directions.—During strong adverse winds shelter will be found in Port Sigri, and a steamer will have no difficulty in entering either northward or southward of Sidusa Island.

Digitized by Google

Port Sigri with strong northeasterly winds is difficult of access in a sailing vessel, but if it is determined to enter, the shoal extending from the southern end of Sigri Island and the ledges from Sidusa and Phanæ Islets should be avoided. With a moderate breeze a vessel can work in, and the dangers will probably be recognized by the discolored water.

Supplies of meat, vegetables, and bread can be obtained, in addition to which abundance of grapes, figs, melons, etc., are to be had, and the hillsides close to the anchorage swarm with partridges.

Telegraph.—Port Sigri is a telegraph station.

Ordymno Point, the northwestern extremity of Mityleni, is 6 miles nearly from Sigri Island. The coast between is irregular and the water all along deep, but the salient points should be given a wide berth. Between Ordymno Point and the point westward of it is a bay, in which is the islet of Agios Ioannis. During southwesterly winds temporary anchorage in 10 or 12 fathoms water will be found in the southwestern part of the bay on the eastern side of Ordymno Point. This bay is exposed to north and east winds, and the holding ground is bad. Steamers seeking shelter here in cases of actual necessity from a southwesterly gale should leave directly it moderates or there is the least indication of any change, as the wind may chop round suddenly to the north and blow with great violence; therefore not a moment should be lost in leaving on the slightest indication of any change. Ordymno Point and Agios Ioannis Islet are skirted by rocks and should be given a wide berth. The neighborhood abounds with game.

North coast.—From Ordymno Point the northern coast of Mityleni trends eastward about 11½ miles and then northward 3 miles to Cape Molivo. At about 2½ miles eastward of Ordymno Point and close inshore is Merminga Rock, above water, and 700 yards eastward of it is another but larger rock, each with shoal water round. At 1¼ miles farther east is Gavatha Point, with a rocky shoal extending off about 400 yards, and at 1 mile northeastward of the point and ½ mile from the shore is Gavatha Rock, above water, near the northern end of a shoal, and steep-to. The mountains about 1 mile within the coast are about 1,200 feet high.

Petras Islet.—In the bight where the coast turns to the north and about 1 mile westward of the little village of Petras is the islet of Petras about 700 yards in diameter, and between it and the shore are two rocks above water, the eastern one of which is connected by shoal water to the shore, but between the rocks there are 10 fathoms. A sunken rock lies near the northwestern side of Petras Islet; with this exception, the water around it is deep. From the village of Petras northward the shore is skirted by rocks.

Digitized by Google

Cape Molivo is a cliffy irregular headland projecting westward and skirted by rocks.

Molivo Road.—On the southern side of the cape is the little town and castle of Molivo, with anchorage off it during easterly winds in from 10 to 20 fathoms, but the water deepens suddenly.

Supplies.—Refreshments of all description are plentiful, especially vegetables and fruit.

Communication.—Two steamship companies running between Constantinople and Smyrna call here weekly.

Muselim Rock.—Muselim Rock, in the middle of the channel of that name, is awash, and is situated 4½ miles 54° from Cape Molivo. A patch with 4 fathoms water on it lies about 700 yards 316° 30′ from the rock, and another patch with the same water over it, 800 yards 111° of it. A shoal, on which the depth was not obtained, was reported by the French frigate *Zénobie*, in 1861, to be situated ½ mile 1° 30′ from Muselim Rock. The existence of this shoal must be considered doubtful. The water is deep all round these dangers, which are easily avoided by keeping 1 mile or so either from the northern or southern shore.

Cape Skammia.—From Cape Molivo the coast trends eastward for 8 miles to Cape Skammia, the northern extremity of Mityleni; it is all along bold, with deep water, except at about 2 miles eastward of the northeastern projection of Cape Molivo, where a rocky shoal borders the coast eastward for about 1 mile. A rock having only 2½ fathoms over it is situated about 200 yards northeastward of Cape Skammia.

At 2½ miles inland from Cape Skammia, Mount Lepethymnus is 2,752 feet high.

Light.—A fixed red light is shown, at an elevation of 66 feet, from a mast over a white house on Cape Skammia; it is visible 6 miles.

Cape Tomari is a cliffy headland, 5 miles southeastward of Cape Skammia; the coast between falls back and forms a bay 1½ miles deep, in the northwestern part of which is the little islet of Mono-petra with shoal water round it, steep-to; between the islet and coast of Phero Point there are from 16 to 20 fathoms.

Shoal.—From the southern part of Cape Tomari a rocky shoal with 2½ fathoms on it extends eastward 700 yards.

Tomari Islands, southward of the cape of that name, consist of a group of four islets and some rocks, extending over a distance of 1.7 miles nearly, north and south. Between the northern islets and a ledge of rocks above and below water united to the coast is a narrow passage with 12 fathoms water.

Northeast coast.—From Cape Tomari the coast trends southwesterly for 4 miles and then southeastward and southerly about 13 miles to the town of Mityleni, the capital of the island. The bight

Digitized by Google

formed by the bend of the coast, southward in the Tomari Islands, is called Makri Bay, and has convenient depths for anchoring.

Reported rock.—A rock is reported to exist, bearing 257° 30′ 1,800 yards from the southern extremity of the southern Aspri Island (the southern islet of the Tomari group).

The exact depth over the danger being unknown, it has been marked on the charts as a rock with less than 6 feet water on it.

Lismoni Islet (*Erimo Nisi*).—In the southern part of Makri Bay is the little islet of Lismoni, with a reef extending from its southwestern side and 8 to 12 fathoms water between it and the south shore.

At nearly midway between Makri Bay and the town of Mityleni is a small inlet, with from 4 to 6 fathoms water, called Mestegna Cove; and 1½ miles southeast of the cove is the little islet of Kidonia, united to the shore by a ledge with from 3½ to 5 fathoms on it. There are two other islets or large rocks close to the coast, one northwestward of Mestegna Cove, the other between Kidonia Islet and the town of Mityleni. The water all along, at ½ mile from the shore, is deep.

Mityleni Channel.—This channel is bounded by the island of Mityleni on the west and the coast of the mainland on the east. Its general direction is north-northwest, and length 30 miles, with an average breadth of about 8 miles; but between Tomari and Eleos Island, at the northern part, the distance is only 3½ miles. The navigation is easy, the channel is well lighted, and the only offlying danger is Eleos Rock, lying about 1 mile southward of Eleos Pulo.

Coast.—From Cape Mal-tepeh, the coast of the mainland trends northward 2½ miles to the entrance of South Channel to Port Ajano; it is very broken and irregular, but steep-to and clear of danger.

Cane or **Ajano Islands.**—The Cane or Ajano are two islands united by a bank with from about 2 to 4 feet water on it. The inner of the two, which is called Makro Nisi, is 1 mile in length north and south, and forms with the coast of the mainland a narrow passage to Port Ajano, bordered by shoal water on either side, but from 5 to 10 fathoms deep, and called South Channel. The shoal water extends nearly 150 yards southward from the southern end of Makro Nisi. On the mainland within the entrance are the ruins of Cane and hot springs.

The outer Cane Island is nearly ¾ mile in length, and its western shore is clear of danger. At about 12,200 yards northward of it and the same distance from the coast are the Nikolo Rocks, with shallow water extending ¼ mile eastward. The largest rock has a white house upon it.

Shoal.—A 3½-fathom patch lies 600 yards 70° 30′ from the northern extremity of Nikolo Rocks.

Digitized by Google

Port Ajano is a narrow inlet running in about 1 mile northeastward; the inner part is shallow, but in the outer part over a distance of about 800 yards there are 5 to 6 fathoms water. The North Channel, between the Cane Islands and the Nikolo Rocks, about ¼ mile wide, is through a narrow passage between the shoals on either side, and only 3¼ fathoms deep. The South Channel, between Makro Nisi and the main, is described above.

Kabakum Bay.—From Port Ajano the coast trends round to east-northeast for 5 miles and then turns northwestward for about 17 miles to Tuz Burnu, the southwestern extremity of a hilly peninsula. The southern portion of this coast forms a bight 4 miles deep, called Kabakum Bay, with from 20 to 8 fathoms water, mud bottom, and where shelter may be obtained from southerly and easterly winds. The village of Dikili is in the eastern corner of the bay.

Lights.—At about ½ mile northward from the village of Dikili two fixed white lights, placed vertically, are exhibited at an elevation of 59 feet above the sea, and are visible 10 miles. (See Light List.)

Trade.—The principal exports are barley, valonea, beans, peas, wheat, and raisins; the principal imports are sugar, cattle, flour, rice, salt fish, and sacks.

Communication.—The Pantaleon Co.'s and Mahsuse Co.'s steamers between Smyrna and Constantinople call at Dikili fortnightly. Dikili is also a telegraph station.

Suna Bay (*Tatli Su*), at the northern end of the coast just mentioned, affords shelter from all northerly and easterly winds, in from about 18 to 8 fathoms, mud. In the southern part of Suna Bay a sandy tongue called Suna Point projects upward of 1 mile northwestward, forming on its northern side the bay of Ayasmata, with 4 fathoms water at the entrance, but shallow within. At the head of the bay is the dogana or customhouse.

The eastern shore of Suna Bay and the coast southward of it are bordered by shallow water, which, southward of Suna Point, shoals off 1¼ miles.

Shoal extended.—The 2-fathom curve on the eastern side of Suna Bay extends (1916) farther westward than shown on the charts.

Telegraph cable.—Near Aspro Point, in Suna Bay, is landed a cable from the town of Mityleni, which affords connection between the latter and the town of Aivali. Vessels should avoid anchoring near it.

Mosko Islands.—This group consists of about 20 islands, islets, and rocks, all of them most irregular in shape, with numerous sunken dangers, extending over an area of about 8 miles north and south by 9½ miles east and west. Mosko Islands lie northward of Tuz Burnu, and bound the eastern side of the northern part of Mityleni Channel.

Digitized by Google

Eleos Island, which with Eleos Pulo, are the westernmost of the Mosko Islands, is about ½ mile in diameter, and surrounded by shoal water, which at its northwestern point extends off nearly 300 yards. Close-to, on its southwestern side, is Eleos Pulo, a cliffy islet ¼ mile in length, with rocks extending a cable southwestward. These and the Tomari Islands to the westward, as already stated, form the narrowest part of Mityleni Channel, the distance across being 3½ miles.

Light.—A fixed white light is shown, at an elevation of 197 feet, from a white stone tower on the summit of Eleos Island; visible 14 miles. (See Light List.)

Eleos Rock.—This danger, with 2½ fathoms water on it, is situated 1.3 miles 184° from Eleos Island Lighthouse, and rises from a rocky bank 400 yards in extent north and south, with from 3 to 5 fathoms on and 6 to 15 fathoms around it. When in the vicinity of the rock, Eleos Lighthouse should not be brought to bear between 356° and 13°.

Gymno Island, in the form of a boot with its toe to the southwest, is 1.7 miles in length, 1¼ miles in greatest breadth, and 175 feet high. Shoal water extends from 400 to 600 yards off its shores, excepting at Ali Burnu, where it is moderately steep-to.

Lights.—Two fixed red lights placed vertically are exhibited, at an elevation of 65 feet, on Ali Burnu, the southeastern extremity of Gymno Island; they should be visible 6 miles.

Anchorage.—Ali Burnu is separated from the shore of Tuz Burnu by a passage nearly 800 yards wide, but which is narrowed to half that distance by shoal water on either side, leaving in mid-channel a depth of 9 fathoms, leading into a roomy and well-sheltered anchorage with 15 to 17 fathoms water, soft mud bottom, between Gymno Island and the coast. The anchorage, which has occasionally been used by the British Naval Squadron, extends as far northward as Rowley Point, but there it is more exposed; it is commonly called Mosko Nisi anchorage.

Caution.—The shoal water from the shore northward of Tuz Burnu is reported to have extended more into the channel than was formerly supposed. It is therefore necessary when passing between this point and Gymno Island to keep nearer the island than the mainland.

Current.—A current generally sets strongly through the passage to the northward.

Tuz Burnu is precipitous, and of a whitish color, the only cliffs in the vicinity presenting such an appearance.

Water.—Opposite Gymno, on the margin of the beach, in the hollows between the hills, fresh water may be obtained by sinking wells 3 or 4 feet deep. During the winter season the ground, owing

Digitized by Google

to the rain, is everywhere full of springs; but in dry weather there would be difficulty in procuring a large supply of water, as there are no permanent springs in the vicinity of the anchorage.

Caledonia Shoal.—This shoal, within the depth of 5 fathoms, is about ¼ mile in length north and south, and has from 2 to 4 fathoms water on it and 10 to 14 fathoms around it. The shoalest part lies nearly 1,400 yards 356° from the northern point of Gymno Island.

Mosko Island (or the Fragrant Isle).—This irregularly formed island extends about 4½ miles north and south and 3½ miles east and west, and is separated from the northern extremity of Tuz Burnu Peninsula by a distance of about 300 yards, and across the shallow flat (which till recently joined them) has been dredged a channel, which will be alluded to later on in the description of Aivali Bay. It may be said to be divided into two portions. The southern part is the larger, and in the center is 623 feet high, with a projection to the eastward covering Aivali Bay.

The northern part of Mosko Island is comparatively narrow, running east and west, with a hill at each end, that on the west being 487 feet high. The two portions of the island are united by a narrow neck of land, being in one place only about 400 yards across and 1½ miles in length. The shore all around the island is contorted and bordered by shallow water and rocks.

To the eastward of Mosko Island are several islets, rocks, and shoals with deep water between them, through which the eye and chart must be the guide.

Mosko Road.—On the western side of Mosko Island is Mosko Pulo, close-to, with a narrow boat passage between them. The bight formed by the southern coasts of the two islands is called Mosko Road, where there is limited anchorage in 11 to 13 fathoms, mud bottom, but open to the southwest.

Shoal.—In addition to the spits extending from the south coast of Mosko Island to a distance of 600 to 800 yards, an isolated shoal with 3 fathoms on it lies 1,200 yards 181° 30′ from the southeastern extremity of Mosko Pulo.

At about 1,200 yards westward of Mosko Pulo is Kalamo Islet, and partly covering the space between the two, on the north, is Leiah Islet, the three islets forming another anchorage, with 8 to 11 fathoms, mud.

Kalamo Pulo, with shoal water extending from it to the southeastward, lies ½ mile westward of Kalamo; the water is deep between these two islets, excepting that 350 yards westward of the southwestern extremity of Kalamo there is a rock above water and others covered close around it. Between Kalamo Pulo and Eleos Island, before alluded to, the passage in mid-channel is clear and deep.

Digitized by Google

Aivali Bay.—This landlocked sheet of water extends 4 miles in a northeast and southwest direction with a most irregular outline, its extreme breadth being 1½ miles. The depth in the central part over a level bottom is 6 fathoms, which decreases toward the extremes.

The bay is covered on the north by Mosko and Krommido Islands, and the latter is joined to the mainland by a causeway through the shallow water.

Towns.—On its eastern shore is the town of Aivali, containing a population of about 60,000, nearly all of whom are Christians. The town possesses several olive-oil mills, including one for the production from olive stones; it also has several soap factories and tanyards. The town of Mosko, with a population of about 8,000, is on Mosko Island, in the northwestern corner of the bay.

Taliani Pass.—The western entrance to Aivali Bay, called Taliani Pass, is between Mosko Island and the northern extremity of Tuz Burnu Peninsula. The artificial channel, with a depth of 16 feet, is nearly 1 mile in length and 40 yards broad, the bottom being partly rock and partly sand.

The Mosko Island side of the channel is marked by buoys and beacons colored red; the south side by buoys and beacons colored white.

Lights.—A fixed white light is exhibited from the western beacon, which stands insulated on the edge of the shoal extending from the southern shore of Mosko Island. The remainder of the channel is illuminated by six red lights, arranged in pairs, three red lights on each side of the cutting.

These lights are exhibited from small cabins, painted white, erected on blocks of stone placed on the edges of the channel.

Tidal stream.—There is a perceptible tidal stream running through this channel, and there appears to be a rise and fall of about 2 feet in Aivali Bay.

Directions.—If taking this channel, approach the outer pair of buoys on a 62° bearing.

North entrance.—The northern entrance between Mosko and Krommido Islands is a narrow channel, with a least depth of 2 fathoms, and marked by three beacons and four buoys. The outer beacon is placed on the small islet on the northern side of the entrance, the two inner beacons are placed on either side of nearly the narrowest part of the channel, and just within two piers that extend a short distance from each island. Two buoys are moored near the outer entrance and two near the inner entrance. The fairway lies between the buoys and between the two inner beacons.

Anchorage.—The anchorage of Aivali on the eastern side of the bay is good, there being deep water and good holding ground close to the town.

Digitized by Google

Communication.—Aivali is in telegraphic connection with the rest of the civilized world. Steamers run frequently to Smyrna, Mityleni, and Constantinople, and weekly to Lemnos, Dedeagatch, and Saloniki.

Trade.—The exports consist principally of oil, soap, hides, and flour; the imports consist of raw hides, wheat, and sugar.

Water is reported good and provisions plentiful at Aivali.

Pyrgo is an irregularly shaped island about 1¾ miles in length north and south, with a tower on its summit 295 feet above the sea; it is nearly united about the middle of the east coast to the western extremity of the northern part of Mosko Island, the two forming a deep bay open to the south, with several shoal patches.

Mosko Island, northeast anchorages.—During strong winds from east-northeastward anchorage will be found under the lee of Kudhu Island in from 6 to 9 fathoms, soft bottom. This island lies 1½ miles 122° 30′ from Mavromati Point, the northeastern extremity of Mosko Island. The anchorage northeastward of the town of Mosko is in from 10 to 15 fathoms, but exposed to the east-northeast, which is the worst wind at this anchorage, blowing down the Gulf of Adramyti. Merchant vessels visit the anchorage for oil.

Of the other Mosko Islands and dangers it is useless to give a more detailed description, and the navigator is therefore referred to the chart.

Gulf of Adramyti.—This gulf in continuation of the Muselim Channel is upward of 20 miles long, and between the Mosko Islands and the shore northward of them about 8 miles wide. The coast on the north is closely backed by high, mountainous land, and between 8 and 9 miles in from the head of the gulf Mount Ida attains an elevation of 5,750 feet above the sea. The land on the southern side of the gulf is hilly, with chains of mountains in the interior, and 12 miles from the sea is Mount Sailejik, 4,010 feet high, while the land at the head of the gulf is an extensive, rich, and well-cultivated plain.

Cape Kara-tepeh (ancient *Pyrrha* promontory), on the southern side of the gulf and about 6½ miles east-northeast from Mosko Island, is a bold, rounded headland, and like Dahlina Point, 3½ miles farther on, may be rounded at a short distance; the coast between the two points forms a bight 1½ miles deep.

Coast.—From Dahlina Point the coast in front of a ridge, which culminates in a hill 595 feet high, trends eastward 3 miles, and then a low shore continues northward and around westward, forming the head of the gulf. The bend in the coast to the southeastward is called Kemer Bay, from the village of the same name 2¼ miles inland to the eastward. A river runs into the bay, and on the south shore is the customhouse.

Digitized by Google

Rock.—A rock with less than 6 feet of water over it has been discovered in Kemer Bay, about 1,300 yards southwestward from the ancient mole on the northern point of the Bay.

Axia Bay is in the northeast corner of the gulf, and vessels may anchor off the village in any convenient depth in from 17 to 7 fathoms, mud; the latter depth will be about ½ mile from the shore. The town of Adramyti (ancient *Adramyttium*), from which the gulf takes its name, stands about 5 miles to the eastward.

Communication.—Steamers of the Pantaleon and Mahsuse companies call at Axia Bay fortnightly from Constantinople and Smyrna. The town of Adramyti is a telegraph station.

Water.—Several streams run into the sea near the village, and a plentiful supply of good water may usually be obtained; although a report states that in August, 1888, no water could be obtained.

Supplies.—Oxen, sheep, poultry, vegetables, etc., can be procured from the neighborhood and town of Adramyti.

Ilija Bay is 2 miles westward of Axia Bay, and here there is anchorage in 9 fathoms, muddy bottom, about ½ mile from the shore, or farther out if necessary.

Water.—Good water can be procured in any quantity from a clear, running stream. Boats can go either side of the entrance, and hose of 30 or 40 fathoms in length will lead into them. At 200 yards from the river there are 5 fathoms water, so that vessels coming here expressly for water may anchor as near as convenient.

Coast.—Following Ilija Bay to the southwestward is a low point, and at 1½ miles beyond it is Kara Point, low, salient, and steep-to; between the two points a little river runs into the sea. The coast thence for several miles is thickly wooded with olive trees, and farther westward are scattered towns and villages, backed by highland. It is all along clear of danger (excepting a shallow patch bordering the shore close in, here and there) for 22 miles to Katagar, a projecting point on the northern side of Muselim Channel.

Muselim Channel is the name given the channel separating the north coast of Mityleni Island from the mainland and leading to the Gulf of Adramyti and Mityleni Channel. The southern shore of Muselim Channel may be said to be comprised between Capes Molivo and Skammia. The northern shore consists of the coast between Katagar Point and Cape Baba. The least width of the channel is 4¾ miles, and with the exception of the dangerous Muselim Rock and patches and the shoals eastward of Sivriji Point now to be mentioned, it has no outlying dangers.

At 2 miles westward of Katagar Point is another point, less salient, with a shoal extending about 300 yards from it; between the two points is a bay with the remains of an ancient mole, and a little inland is the village of Behram and the ruins of ancient *Assos*.

Digitized by Google

Sivriji Point is 6 miles westward from Katagar Point, and will be known by the white lighthouse on it.

The shore for upward of 1 mile northeastward of Sivriji Point is foul, and shallow water with patches of 3 and 4 fathoms extend off nearly 1 mile; the outer patch, of 3 fathoms, lies nearly 1 mile 97° from the lighthouse, and falls down suddenly to deep water.

Light.—A fixed white light is shown, at an elevation of 66 feet above the sea, from a mast over a white house on Sivriji Point, visible 10 miles.

Sivriji Bay, westward of the lighthouse, is upward of 1 mile wide at the entrance and nearly 1,400 yards deep, with from 17 to 9 fathoms water, which gradually shoals. An ancient mole, appearing like a reef, runs off from the eastern side of the bay. When entering the bay from the eastward or leaving it for that quarter, the shoals eastward of Sivriji Point should be given a wide berth and the lighthouse kept bearing northward of 311°.

Muselim Rock bears from the lighthouse nearly 2¾ miles 176°.

Cape Baba.—This headland (ancient *Lectum prom.*) is high and bold, the termination of mountainous land which at less than 2½ miles within rises 1,665 feet above the sea, a rather less elevation than Mount Ordymnos of Mityleni. Coming from the northward, and when abreast of the cape, it appears to descend almost perpendicularly to the sea, though on opening Lodos Point to the eastward, which slopes gradually and is not nearly as high, this appearance is lost. The cape is 7½ miles westward of Sivriji Bay, and between, excepting the narrow shoals bordering the shore, the water is all along deep. On the cape is a village and castle, and thence the coast trends north-northeastward 7 miles to the Tuzla River.

An extensive shoal borders the shore in the vicinity of the river, extending off ¾ mile, and falling suddenly to deep water. This latter part of the coast should be given a wide berth.

(For continuation of the coast northward, see p. 382.)

Spitfire Banks.—These banks, with less than 100 fathoms of water, are two in number, and are situated to the westward of Mityleni in the middle of the passage from the Doro Channel to the Dardanelles. The northern bank, 19 miles long in a northeast and southwest direction by 4 miles wide, has two heads—Johnston Bank, with 21 fathoms of water, mud, in latitude 39° 19′ north, longitude 25° 23′ east, and Mansell Bank, with 50 fathoms of water, in latitude 39° 13′ north, longitude 25° 17′ east. The southern bank, roughly circular and 15 miles in diameter, also has two heads—Stokes Bank, with 45 fathoms of water, in latitude 38° 53′ north, longitude 25° 26′ east, and Brooker Bank, with 50 fathoms of water, in latitude 38° 52′ north, longitude 25° 20′ east. These banks consist of sand, shells, and coral, and are surrounded by depths of from 100 to 300 fathoms, with a clay bottom.

Digitized by Google

Strati Island.—This island (ancient *Neæ*) is triangular in shape with its sharp end to the southward. It is 6 miles in extent north and south, about 3¼ miles in greatest breadth, and 973 feet high. On its west side, about 1½ miles from its northern end, is a little bay and a village named St. Strati. The population of the island is about 1,000.

Rubos Islet.—Northeastward 800 yards from Cape Thascoli, the eastern point of the island, is a small rocky islet named Rubos, with shoal water extending 700 yards from it. Between the sunken rocks on either side of the passage inside the islet there are 4½ fathoms water.

St. Apostoli Islet.—A small islet named St. Apostoli lies 400 yards off Cape Kalamaki, the northern extremity of the island, to which it is connected by a reef; 400 yards from the islet there are 25 fathoms water; elsewhere shoal water in no case extends more than 400 yards offshore. Strati Island is about 16 miles from the nearest part of Lemnos Island.

Lemnos.—This island, called by the Turks Stalimeni, in the middle of the northern part of the Aegean Sea between the base of Mount Athos and the island of Tenedos, is an irregular quadrilateral, about 15 miles each way, and nearly divided into two parts by the bay of Purnea on the north and that of Mudros on the south. The island is hilly, but of no great elevation. Mount Skopia, at the northwestern extremity, is 1,410 feet high; Mount Therma, in the southwestern part, 1,130 feet high; and Mount Phako, on the south coast, 1,106 feet high.

Productions, population, etc.—The hills are rugged and of barren appearance, and the soil for the most part thin and sandy. In some places, particularly in the west and south, corn, oil, wine, fruit, and a small quantity of cotton are produced, and a few cotton stuffs are manufactured. Grain and wine are the only exports. The population of the island is about 27,000, mostly Greeks, many of whom are employed in fishing. Kastro, the principal town, and where the governor resides, is on the west coast. (See p. 379.)

Communication.—By three lines of steamers frequent connection is kept up with Saloniki, Constantinople, and Smyrna. Kastro is also a telegraph station.

Cape Irene, the southeastern extremity of Lemnos, and much lower than the land within it, is bold and salient, and its south side may be approached to the distance of ¼ mile.

Cape Valanidhi, 2½ miles westward, is lower, with a reef running off it 800 yards, which should be given a wide berth in passing, though it may generally be known by the color of the water; Phako Point, bearing 282° 30′, well open southward of Kastra Island, leads clear of it.

Digitized by Google

Mudros Bay is the name given to the outer portion of an extensive inlet on the southern side of Lemnos Island, trending 4 miles in a north-northwestly direction and then the same distance northeasterly, the latter portion being known as Port Mudros (Porto San Antonio), to be presently described. The entrance points to the bay may be considered as Cape Valanidhi on the east and Kombi Point on the west, distant from each other nearly 3 miles. With the exception of Cape Valanidhi Reef and a fringe of shoal water extending from 200 to 400 yards from each shore, the bay is free from outlying dangers as far as the line joining Buda and Vrulidhi Points, but inside the 3-fathom curve there are many rocks which are dangerous to boats. It has from 13 to 24 fathoms water, mud bottom, and though open to the southeast is an excellent summer anchorage for any number of large vessels, and is reported to be safe in winter.

Caution.—The eastern side of Mudros Bay southward of Cape Malathria is extended from an old and imperfect survey.

Kombi Point, the western point of entrance to the bay, is a small rocky peninsula surmounted by Dawkins Hill, 282 feet high, being the end of a long ridge from Mount Phako.

The west coast, between Limni and Vrulidhi Points, is deeply indented by Tarrant and Fuller Coves. Limni Point is easily discernible, being of a reddish color, with a white patch near the extremity.

Kombi Island, 177 feet high, is connected with Kombi Point by a rocky ledge, shoal water extending upward of 600 yards to northward of the connecting reef and 300 yards northeastward of the island.

Light.—A group flashing white light, elevated 187 feet, is shown from a white masonry tower on the summit of the island; visible 15 miles. (See Light List.)

Kastra Island, 200 yards to the southward of Kombi Island, is a cliffy island about 140 feet high; it should be given a berth of at least ¼ mile. . There is a narrow boat passage between it and Kombi Island.

Port Mudros.—The entrance points to this spacious and well-sheltered harbor may be considered as Buda Point on the east and Vrulidhi Point on the west, distant from each other 1¾ miles.

Telegraph.—A telegraph station has been established, and is open to traffic.

Shoal.—In addition to the flat extending from Vrulidhi Point, an isolated patch with 2½ fathoms on it lies 600 yards 80° from the northern extremity of that point.

Vrulidhi Bay, westward of the point of that name, extends in a southwesterly direction ¾ mile with a breadth of 800 yards. Anchorage may be had in this bay in 8 fathoms, with Vrulidhi Point bearing 108°, 600 yards, but the width of the entrance is contracted to a little

Digitized by Google

over 200 yards between the 3-fathom curve on each side. On the western side of this bay are three houses, the southern of which is built of white stone, and conspicuous.

Buda Point.—The promontory forming the east entrance point to Port Mudros has three salient points named Buda, Sangrada, and Meganoros. Buda is the southern one of these, having a depth of 5 fathoms 100 yards off. The point is about 30 feet high and composed of low white cliffs.

Sangrada Point is 700 yards northward of Buda Point, the coast between forming an indention 300 yards deep, most of which, however, dries at low water. Depths under 5 fathoms will be found 150 yards from Sangrada Point. The 5-fathom curve, however, between these points extends into the channel, there being not more than that depth 400 yards from Sangrada in range with Meganoros Point.

Light.—A flashing white light, elevated 31 feet, shown from a white metal column, erected on the extremity of Sangrada Point; visible 5 miles.

Meganoros Point, the northern of the three, has a hill 115 feet high, 300 yards at the back of it, and a little rock 2 feet high close outside it. The coast between it and Sangrada Point takes a slight inward curve, being fronted by an extensive bank with from 1½ to 3 fathoms on it, reaching off 300 yards from Meganoros Point. In addition to this, a spit with less than 1 fathom water on it extends 300 yards 254° from the point.

Black Rocks.—The middle and largest of these is 10 feet high, and the group divides East and Middle Passes. On the southern side the 5-fathom curve approaches to 150 yards of the largest rock, otherwise they are surrounded by a shallow bank, which, 600 yards 26° from the largest rock, has only 1 fathom water on it.

The bank under the depth of 5 fathoms extends 250 yards in a south-southeasterly direction from the cluster forming the eastern Black Rock. Not more than that depth will be found 330 yards southwestward from the western Black Rock.

East Pass.—The channel eastward of Black Rocks is named East Pass, the least breadth of which between the 5-fathom curve on either side is a little under 400 yards, and the depth 12 fathoms. The range through this channel (to be again alluded to) is Talikna Point midway between the two mills near Talikna Village, and just open eastward of the near summit, bearing 27° 30′.

Under ordinary circumstances the shoals so far described will be discernible by the discoloration of the water.

Alago Island is situated northwestward of Black Rocks, and the channel between is named Middle Pass. The island is about 1,400 yards long in a northeast and southwest direction by 300 yards in breadth, and 78 feet high. A hut is situated on the ridge 350 yards

Digitized by Google

from its northeast end. A small islet 10 feet high lies close to its southeast coast and 400 yards from the southwest extremity.

Depths under 5 fathoms will be found 150 yards off this islet, and the same depths at about 200 yards from the remainder of the southeast coast of Alago Island.

The 5-fathom curve surrounds the island at about the latter distance, excepting at the southwestern extremity, whence to the western shore of the port not more than 4 fathoms will be found in the channel known as West Pass.

Middle Pass.—The channel between Alago Island and Black Rocks, is 400 yards broad between the 5-fathom curve on each side, with a least depth of 6 fathoms. To lead through the middle of this channel keep the fifth one from the westward of 10 mills in range with Kaloyeraki Point, bearing 24° 30′.

West shore.—From the head of Vrulidhi Bay the west shore of Port Mudros trends in a northeasterly direction with a succession of small points and bays for 2½ miles, and then southeastward for 1 mile to Kaloyeraki Point. Until within ¼ mile from the extremity of the latter this shore is fronted by extensive flats, which should be carefully avoided by the lighter draft vessels using West Pass, keeping 300 to 400 yards from the shore of Alago Island.

Rocks.—The most dangerous part of these flats has near its eastern edge, a reef with less than 1 fathom water on it, bearing 285°, distant 600 yards from the southwestern end of Alago Island, and connected to it by a bar with 4 fathoms over it. Inside this bar the water again deepens to 6 or 7 fathoms.

West Pass is the name given to the channel westward of Alago Island, the dangers in which have just been described, but, having no range mark, it can not be recommended to those without local knowledge.

Kaloyeraki Point, 62 feet high, is the eastern extremity of a narrow peninsula nearly 2 miles long. It is fairly steep-to on its southern side, but a shoal with less than 3 fathoms on it makes off nearly 400 yards northeastward and 1,400 yards in the same direction before the depth of 5 fathoms is reached.

Nikolo Patches, with 3 fathoms water on them, are two isolated shoals on this bank, bearing, respectively, 41° 1,150 yards, and 49° 900 yards from the eastern extremity of Kaloyeraki Point.

A small bank of coral and shells with a depth of 5¾ fathoms over it is situated 1,800 yards 45° from Sangrada Point, or about 250 yards to the eastward of the range mark for the East Pass.

Kaloyeri Rock is a dangerous isolated rock, with 15 feet water over it, bearing 134°, 650 yards from Kaloyeraki Point. The first peak or rise in the land within the Isthmus of Kombi, in range with Sangrada Point, 190° 30′, leads 150 yards southeast of it and close eastward of Nikolo patches, in 4 fathoms of water.

Digitized by Google

Cameron Shoal.—Between Kaloyeraki Point and Cape Pavlos on the opposite side of the port, lies a triangular-shaped rocky bank, the sides of which are about 300 yards long, the least depth of 4½ fathoms being situated near the northwestern corner and bearing 84° 30′, ¾ mile from Kaloyeraki Point; an isolated patch of 5 fathoms lies nearly 200 yards nearer to the latter. Another small spot, with the same depth over it, lies 134 yards southward of the southern end of Cameron Shoal bearing 97°, 1,650 yards from Kaloyeraki Point.

Bailey Shoal, with 4¾ fathoms on it, lies 1,930 yards 54° 30′ from Kaloyeraki Point.

St. Nikolo Islet, 20 feet above the water, is situated 700 yards northward from Kaloyeraki Point. It is on a reef, on which at 250 yards east-southeastward, is a small rock, 10 feet high, called Anvil Rock.

Turk Islet, with a hut upon it, and 20 feet high, lies nearly ¼ mile west of St. Nikolo Islet, and joined to the northern side of the peninsula by a dry reef.

North Shore.—From the head of the long shallow bay running in northward of Kaloyeraki Peninsula, the northern shore of Port Mudros trends, with a series of slight points and bights, in a northeastern direction 2½ miles to a projection forming the eastern entrance point of a stream, and close southward of which is an islet 3 feet high. The depth of 3 fathoms will be found at about 200 yards from this islet.

From hence the low shore turns and runs eastward 1½ miles, backed by cultivated marsh land watered by several streams, and fronted by shallow water, not more than 3½ fathoms being found at an average distance of 700 yards. The shore now turns abruptly to the southward for 700 yards to Talikna Point.

Villages.—At ¼ mile from the head of the long shallow bay just mentioned is the village of Portianos, on the northern outskirt of which is a conspicuous church. Ypsoparago is 700 yards northeastward of Portianos and nearer the shore. Sarpi is ¾ mile westward of the stream just mentioned and 700 yards from the shore. A coast road connects these three villages with Talikna and Mudros. On the shore, midway between Ypsoparago and Sarpi, are a landing pier and chapel.

Talikna town, having a church with a conspicuous white cupola, is situated 700 yards northward from this corner of the port; ¼ mile southeastward of the town are two hills, on which are situated two conspicuous windmills serving as part of the range mark through East Pass.

Talikna Point, with a rock 2 feet high 150 yards northward of it, is important as being part of the range mark just mentioned, and is rocky and conspicuous. Here the shore of the port trends again east-southeastward for ¾ mile and then southwesterly 1.3 miles to

Digitized by Google

Cape Pavlos. The land of which Talikna Point is the termination attains an elevation of about 210 feet at 1,400 yards from the shore, after which, close to the shore, it partakes somewhat of the same cultivated marshy character as that at the head of the port.

Mount Komi is a conical hill situated about 1 mile from the shore of the bight formed between Talikna Point and Cape Pavlos, and will be mentioned again in connection with the directions for East Pass.

Depths.—Roughly speaking, a line joining Talikna Point and St. Nikolo Islet marks the limit of the depth of 5 fathoms until within ½ mile of the latter, when the soundings increase to 6 or 7 fathoms until 700 yards westward of that islet.

Three-fathom patches.—As an exception to the regular and very gradual shoaling of water northward of this line, two banks with 3 fathoms on them, lie 1 mile 257°, and 1,700 yards 282°, respectively, from Talikna Point.

Ispatho Island, 40 feet high, with a building and trees on it, is oval shaped, with a mean diameter of about ¼ mile. It is embayed about 700 yards northeastward of Cape Pavlos. A reef extends from it westward 300 yards, and depths under 5 fathoms will be found west-northwestward 700 yards. From the latter position the edge of the 5-fathom curve runs irregularly in the direction and to within 400 yards of Talikna Point.

Cape Pavlos, 1¼ miles northeastward of Meganoros Point, will be recognized by the village of Mudros 700 yards back from it, a group of windmills situated upon a hill 80 feet high halfway between, and a chapel near the shore. A bank with less than 1 fathom water on it extends 350 yards from the cape and also from the shore ¼ mile southeastward of the cape, while off this part of the coast depths under 5 fathoms extend from 500 to 600 yards. From Cape Pavlos the shore trends south-southeast for ½ mile, and then gradually curves westward to Meganoros Point, already described. In the southeastern part of the bay thus formed are the mouths of several streams.

In the middle of the bay and also near Meganoros Point the 5-fathom curve approaches the shore to within 400 yards; in other parts the bank under that depth extends off 700 yards.

Pier.—A landing pier for the village of Mudros is situated 600 yards southeastward from Cape Pavlos.

Current.—A slight current sets inward along the eastern shore of the port and outward with a little more strength round Kaloyeraki Point.

Anchorage may be taken up in any part of Port Mudros, clear of the dangers and extensive shore banks already mentioned, the bottom consisting of sand and mud; but the most spacious anchorage, in from 6 to 10 fathoms, will be found inside the triangle formed by Meganoros Point, Cape Pavlos, and the northeastern extremity of Alago Island, taking care to avoid the banks extending from these points,

Digitized by Google

as well as Kaloyeri Rock, and Cameron Shoal, with the detached 5 and 5¾ fathom patches southward of it.

Directions—East Pass.—Before Limni Point bears southward of 267°, in approaching this the deepest channel into Port Mudros, bring the largest and central Black Rock in range with the summit (62 feet high) of Kaloyeraki Point, bearing 5°. Steer for them so, until Talikna Point is exactly midway between the two mills (situated southeastward of the village of Talikna) and just open of the near summit, bearing 28°. When this range mark comes in range, the southern extremity of Buda Point should be bearing 83°, distant 800 yards, and Meganoros and Sangrada Points should be in range 49° with Cape Pavlos just open northwest of them. Steer in on the rangemark, which between Sangrada Point and Black Rocks should pass midway between the 5-fathom curve on either side, until Mount Komi comes in range with the western mill on Cape Pavlos bearing 62°. A vessel may now take up a berth in the bay on this range, or as convenient.

Caution.—In proceeding out of the port with the range mark astern and therefore not so easy to keep exactly on, it is advisable in the case of a heavy-draft vessel, to find and buoy the end of the spit extending southeastward from Black Rocks.

Middle Pass.—When midway between Buda and Limni Points the southwestern extremity of Alago Island should bear 294°. Steer for it bearing thus until the seventh from the left of 12 mills appears in range with the extremity of Kaloyeraki Point bearing 25°. When the northeastern extremity of Alago Island is abeam, or shortly before, taking care to pass northward of Black Rocks' shallow bank, a vessel may keep to the eastward and anchor as before directed.

As the three conspicuous houses on the western side of Vrulidhi Bay, shut in by the southern end of Alago Island, just clear Black Rocks' bank, a vessel may begin slowly to turn eastward off the range mark, when the houses are lost sight of.

Shoal.—A shoal, with a depth of 4¾ fathoms over it, lies about 500 yards eastward, from the northern extremity of Alago Island, and 100 yards westward of the range mark for Middle Pass.

West Pass.—As already stated, in the absence of local knowledge, this passage without a range mark is not to be recommended, although by keeping about 300 yards from the western side of Alago Island a vessel can carry a depth of 4 fathoms.

Supplies of meat, vegetables, and bread can be obtained.

Water can be obtained from a small stream 1½ miles eastward of Cape Malathria, on the eastern side of Mudros Bay. In the month of August a fair supply may be procured. A launch can approach within 50 or 60 yards of the beach, and the water can be pumped from a pool about 12 yards inshore, where it is quite fresh; the stream has no apparant outlet. At nearly ½ mile southward of the river a

Digitized by Google

small quantity of water may be obtained from a well, convenient for boats. In the dry season the other rivers in the bay are either brackish or salt, but afford evidence of having a plentiful supply of water during the rainy season.

In Port Mudros itself good water may be obtained from a well on the south coast of the Kaloyeraki Peninsula, 1 mile from that point; also from a spring situated near a house with conspicuous red roof, 1¼ miles southwestward from the well.

Coast.—The south coast of the Phako Peninsula, from Kombi Point to Cape Stavros, trends in a general westerly direction 4½ miles. It has some scattered rocks along it, and westward of Phako Point (a tongue of land projecting about 400 yards) the rocks and shallow water extend beyond this distance.

Praso Island, ½ mile to the northwestward of Cape Stavros, with a deep channel between, is foul and must be given a wide berth.

Port Kondia, westward of Mudros Bay and northward of Cape Stavros is a narrow inlet about 1 mile deep, with anchorage in from 10 to 7 fathoms, mud, open to the southwest. The inner points are foul, and a mid-channel course should be preserved. The village of Kondia is a little more than ½ mile within the head of the port, where the river runs into the sea, and there is a customhouse.

Port Kondia is separated from Mudros Bay by an isthmus about ¼ mile across, which unites the Peninsula of Mount Phako (1,106 feet high) to the main.

The best anchorage is in about 9 fathoms water, with the customhouse bearing 65°, 900 yards.

Temporary anchorage.—There is temporary anchorage for small vessels with offshore winds in the bay next westward of Port Kondia, but a solitary rock, 1 foot high, lies in the middle, and must be avoided.

Cape Tigani.—Mount Stivi, at the southwestern extremity of Lemnos, is a rugged conical hill 530 feet high. At its base on the southwest is the small bay of the same name about 400 yards deep, with from 2 fathoms to 1 fathom water, and open to the south. Cape Tigani is the southern extremity of a little islet, with rocks above and below water between it and the shore. The cape bears 291° and is distant 4½ miles from Cape Stavros; on its eastern side and in front of Stivi Bay is a rock awash.

Tigani Rock.—At 400 yards 190° from Cape Tigani is the rock of the same name, with ½ fathom water on it, 13 fathoms between it and the cape, and 15 fathoms close to its southern side. The rock lies with the western point of Tigani in range with the eastern extremity of Thevates Islets. Vessels rounding Cape Tigani should give it a berth of ½ mile.

Thevates Islets.—The western coast of Lemnos is irregular with one or two little bays and projecting points, backed by elevated hills.

Digitized by Google

At about 1½ miles northward of Cape Tigani are the two small islets of Thevates, united to each other and to the little promontory of the same name by shoal rocky ground.

Cape Thevates and the isthmus which joins it to the main form the western side of Port Plati. The cape is surrounded by rocks, which extend southeast and eastward into the bay ¼ mile.

Port Plati is a nearly circular bay, about ½ mile in diameter, with from 9 to 3 fathoms water, mud bottom. The entrance is nearly ¼ mile wide, with 10 fathoms water between the shoals on either side. The village of Plati is ½ mile inland.

Kastro.—From Thevates Islets the coast trends northeastward to two little rocky points which are foul more than 200 yards off. The northern of these points is 1,800 yards from Thevates Islets, and forms the south entrance point of a bay about ¼ mile wide, nearly in the middle of which is a rock with ½ fathom water on it. In the northeastern corner is a little pier harbor for vessels of very light draft. On the northern side of the bay is a steep, rugged peninsula mass, 700 yards in extent, on which is a castle 409 feet high, which being white is conspicuous. On the isthmus and shore north and south of it is Kastro (ancient *Myrina*) the chief town and seat of government of Lemnos Island, with a population of about 3,000. When bearing 142° it appears conspicuous and imposing.

Light.—A flashing white light, elevation 243 feet above the water, from a white iron column, has been established on the western extremity of the outer wall of the castle; the light is visible 10 miles.

Anchorage.—The best anchorage is in about 10 fathoms, with the northern of two windmills on a hill to southeastward of the town bearing 98° and Kastro Point 344°; but the holding ground, sand, is not good, and a vessel must be prepared to proceed to sea directly the wind shifts to the westward.

Telegraph cables.—Lemnos Island is in telegraphic communication with the rest of the world by means of two cables landed on the northern side of Kastro, one being laid to Saloniki, the other to Tenedos Island; Kastro has a telegraph office, situated near the northeastern mole.

Shoal.—A 4¼-fathom patch lies in the entrance to the bay southward of Kastro, bearing 190°, 600 yards from the western extremity of the peninsula. A conspicuous minaret, near the northeastern mole, bearing 68°, clears the shoal to the southward.

Coast.—The shore between Kastro and Cape Petasi about ½ mile northward, forms another bay somewhat similar in shape to that southward of Kastro, but larger. There is a conspicuous windmill on a small point in the middle of the bay. Kastro Peninsula and Cape Petasi are steep-to, but the rest of this bay has depths under 5 fathoms extending 400 yards from its shores. Northeastward 1¼ miles from Cape Petasi is Mount Athanasi, 1,085 feet high, with a

Digitized by Google

building on it, within ½ mile of the shore. Between the base of the mount and Cape Petasi and ½ mile from the latter are the two detached Skylax Rocks above water.

Kastro Ledge, 200 yards in diameter, with 5 fathoms water on it, is a dangerous obstruction for a heavy-draft vessel, lying 291°, 800 yards from the peninsula. There are 20 fathoms water between it and the peninsula. The conspicuous mill on the shore of the bay northward of Kastro bearing southward of 97°, clears the ledge to the northward.

Petasi Ledge, with 6 fathoms on it, lies ¼ mile 316° from Cape Petasi, with deep water between.

Kaloyeri Point, 2¾ miles northward from Cape Petasi, has a reef extending from ¼ mile in a northwesterly direction, close to which the water is deep.

Cape Murtzephlos (*Palæo Kastro*), the northwestern extremity of Lemnos, 3 miles farther north, is a conical hill connected to the land within it by a low isthmus; southward of it are some yellow cliffs. Mount Skopia, the greatest elevation in Lemnos, 2 miles eastward of Cape Murtzephlos, is 1,410 feet high and ½ mile from the shore.

Siderites Island.—At 4¾ miles east-northeastward from the cape is the island of Siderites, 1,400 yards in average diameter, high, bold all round, and separated from Cape Agrillia by a passage ½ mile wide, and deep with the exception of a 3-fathom shoal near the cape.

Cape Pharaklo, 4 miles farther eastward, is skirted by rocks which extend off more than 200 yards; the coast between is broken with cliffs and sandy bays, and the western part is bordered by rocky ground.

Purnea Bay, between Capes Pharaklo and Soteri, which are 6 miles apart, is 5 miles deep. At the head of the bay is the port of Purnea, and thence the distance across the land to Port Mudros on the south is only about 2 miles, the island being nearly divided into two parts.

Tree Point.—The western shore of Purnea Bay is composed of small rocky points and coves, and at about halfway in Tree Point, an irregular projection, extends beyond the line of coast more than ½ mile, with a reef stretching from it 400 yards. There are anchoring depths, in from about 8 to 16 fathoms, all over the head of the bay, but exposed to the north.

Port Purnea, in the southern part of the bay, is 1¼ miles in extent east and west, about 1,400 yards north and south, and has in the deepest part 7 fathoms water, sand and mud bottom. It is partly protected from the north by Cape Purnea, a point projecting eastward which covers the shallow water, 1½ to 3 fathoms in depth, extending over all the western side of the port. The deeper part, with depths from 4 to 7 fathoms, is exposed to the north, though a 2-fathom shoal extending ½ mile westward from the eastern entrance

Digitized by Google

point affords some shelter from the sea. The anchorage space covers an area of about ½ mile; the passage into the port is 300 yards wide, close to Cape Purnea, and between it and the tail of the 2-fathom shoal from the eastern entrance point.

Port Ekato Kephales, on the eastern side of Purnea Bay, is very similar to Port Purnea. It has depths of from 7 to 2 fathoms water, but is encumbered midway between the entrance points by a shoal with 10 feet water, and outside it another with 3½ fathoms. The passage in is between these shoals and the projecting southwestern entrance point.

Cape Soteri, 251 feet high, the eastern point of Purnea Bay, is cliffy, and extending from its western extremity are the remains of an ancient mole. Shallow water extends off nearly 400 yards from the northeastern face of the cape, and it should not be approached too near. The cape is about 3½ miles westward from Cape Plaka, the northeastern extremity of Lemnos. Between them is a deep bight, in which shoal water extends about ½ mile from the shore.

Cape Plaka, the northeastern extremity of Lemnos, is a steep bold headland, level on the top, and surrounded by a rocky shoal which extends off about 700 yards. Half a mile southward of the cape is a steep cliff, and 1,800 yards southward of the latter is another cliff at the termination of a tongue of land named Voria Kastro; the coast between the two cliffs forms a bay. Thence southward for 2 miles to Petza Point the coast declines in height and is succeeded by a low sandy shore which continues to Kharos Point, a distance of 5 miles farther. Within the sandy shore is Megali Limni, a shallow salt-water lake with an area of about 2 square miles and separated from the sea by a narrow strip of land. Megali Limni is connected with the sea near its northern end by a short canal, spanned by a bridge.

Lights.—On a white masonry tower, 74 feet in height, about 300 yards within the northeastern extremity of the cape, are exhibited two lights. The main light is a group flashing white light, elevated 164 feet above sea level, and visible 19 miles. The auxiliary light is a fixed red light, elevated 105 feet, visible 15 miles over Kharos Bank. (See Light List.)

Kharos Point is small, cliffy, and surrounded by shallow rocky ground which extends upward of 1 mile southeastward. It forms the northern point of a bay named Port Kharos. Between Port Kharos and Cape Irene, the southeastern extremity of Lemnos, are three other bays separated by projecting cliffy points. In any of these bays a vessel will find temporary anchorage during a westerly gale. Mount Parathis, 859 feet high, is situated 2 miles within the shore of the central bay; 1,400 yards southeastward of it is Mount Panagia, 820 feet high, whence the land declines in height to Cape Irene.

Digitized by Google

Kharos Bank.—Fronting the northern half of the eastern side of Lemnos and extending 10 miles from the coast are extensive shallow flats and rocky patches, on many of which there are only from 3 to 1½ fathoms water. The outer of these dangers are named Anatoli and Kinduno Patches and Kharos Reef, the whole being known as Kharos Bank.

From the shore 2 miles northward of Kharos Point a very shallow tongue stretches off in a southeasterly direction 2½ miles, terminating in a reef with less than 1 fathom water upon it, bearing 71° 2¼ miles from Kharos Point.

Kinduno Patch, with 4 fathoms on it, lies on the southern side of Kharos Bank and just inside the 10-fathom curve, bearing 91° 4.6 miles from Kharos Point. Between this patch and the 5-fathom line from the shore the distance is 1 mile and depths from 6 to 7 fathoms. Kinduno Patch is also divided from the eastern part of the bank by a distance of 1¾ miles and depth of 7 to 10 fathoms.

Kharos Reef, With only 1½ fathoms water in it, occupies the western end of a cluster of patches having less than 3 fathoms on them, nearly 1 mile in extent east and west. This shoal bears 83° and is distant 7.6 miles from Kharos Point.

Anatoli Patches is the name given to two 3-fathom shoals at the outer end of Kharos Bank. They lie north-northwest and south-southeast ½ mile from each other, the eastern patch bearing 83° 9.3 miles from Kharos Point. It bears also 133° a little over 8¾ miles from Cape Plaka and 49° 14 miles from Cape Irene.

A bank with 6 fathoms on it lies 153° 1.8 miles from the eastern Anatoli Patch. Depths under 10 fathoms extend 1 mile eastward and northeastward from Anatoli Patches.

Caution.—Kharos Bank is generally recognized during day by the color of the bottom; but it should be given a wide berth, as southward of the bank the current sets northward.

Cape Eski Stambul.—From the mouth of the Tuzla River the coast of Anatolia continues northward 10 miles to Cape Eski Stambul and is mostly a sandy beach, behind which the mountains of Kaz and Chigri rise respectively 1,595 and 1,648 feet high. Cape Eski Stambul is a small sand hill of moderate height, inclining a little to the westward, on which is the village of Talian, erected mostly on the ruins of the ancient town of *Alexandria Traos* (or New Troy), founded by Alexander the Great.

Numerous antiquities are to be seen to this day not far to the eastward of this village, of which the most remarkable are the remains of a large theater, the ruins of a palace, an aqueduct, mineral-water baths, and a large outer wall. The port of *Alexandria Traos* is at the present time entirely filled up and separated from the sea by a strip of lowland. It was a basin 400 feet in length by 200 in breadth.

Digitized by Google

Suffren Shoals.—Cape Eski Stambul is surrounded by a bank of rock and sand, which extends 1¼ miles north and northwestward, and on the outer part of which there are only 2¼ fathoms water and 1½ fathoms about 700 yards from the shore. These dangers are named the Suffren Shoals, the southwestern side of which runs 316° for the distance of 1 mile from the cape; the farthest out part of the shoals, with depth of 3 fathoms, bears 339°, and is distant 1.2 miles from Cape Eski Stambul.

To avoid them keep the gap just inside Paleo Kastro open of Yukyeri Point bearing eastward of 9°. A good mark is not to stand farther toward the shoal than just to open the little islet of Drepano (one of the Rabbit Islands) eastward of Gadaro. When Cape Marmara of Tenedos bears about 281° and is in range with Galley Point, a vessel will be well northward of the shoals and may keep nearer the mainland shore, where there will be less current.

At night Gadaro Island Light should be kept bearing eastward of 350° until northward of Suffren Shoals. (For continuation of this coast see p. 383.)

Tenedos Island, called by the Turks Bokcha Adasi, is nearly 6 miles in length in a northwest and southeast direction and its eastern and broadest part is 3 miles across. At a little more than 700 yards within Mela Point, the northeastern extremity of the island, is Mount Elias, a conical hill 625 feet high, conspicuous from the westward. At a short distance southeastward of Mount Elias is another hill, named Sana, 385 feet high, with a monastery on its summit. The other parts of the island are of moderate elevation and decline in height toward the western end.

Products.—The island produces corn, cotton, oil, and wine; the latter has always been held in great estimation.

Population.—The population of the island is about 4,200, one-third being Mohammedans.

Light.—A fixed white light is shown, at an elevation of 72 feet, from a white masonry tower, on the southern headland of Ponente Point; it is visible 15 miles. (See Light List.)

South coast.—The best anchorage under the southwest coast of Tenedos Island is reported to be about 1½ miles northwestward of Cape Marmara and southward of the tumulus marked on the chart. The holding ground is mud and sand; there is a good natural landing place here. The whole of this coast is very broken and foul ground extends off the shore in places for a distance of ½ mile.

North coast—Kheraki.—At about 1½ miles eastward of Ponente Point and about 800 yards from the shore is the islet of Kheraki, with a rock above water close to its northeastern side.

Shimal Bank.—Northward of Kheraki is a large and rocky bank named Shimal Bank, with shoal patches, on which the depth varies from 5 to 2½ fathoms. These rocky shoals form round the north-

Digitized by Google

western end and northern coast of Tenedos a series of dangers extending 1.1 miles westward, 1¾ miles northward, and nearly 3 miles northeastward of Ponente Point, and great care should be taken to avoid them.

Shimal Rock, with 15 feet water over it, lies near the northeastern edge of Shimal Bank, 48°, 2.5 miles from Ponente Lighthouse.

The mills on Cape Yeni Shehr in range with the southeastern side of Mavro Island, bearing 56°, lead northwestward of Shimal Bank.

Gadaro Islet three times its length open northeastward of Petro Islet, the latter bearing 122°, leads northward of Shimal Rock.

Streblos Islet.—At 3½ miles eastward of Ponente Point and 600 yards from the shore is Streblos Islet, situated on a rocky bank which extends for 400 yards outside the islet; nearly ½ mile northwestward of the islet is the outer of a chain of rocks with less than 1 fathom water on them, extending 1,400 yards from the shore.

Talbot Rock, 1 mile eastward of Streblos, is the summit of a rocky shoal nearly ¼ mile in length in a north-northeastward and south-southwestward direction, and the least water on it is 3 feet. The shoal is steep-to on its northern and western sides, its outer edge being 800 yards offshore.

Petro Islet.—This small rock or islet, 700 yards 29° from Mela Point, the northeastern point of the island, has a depth of 4 to 5 fathoms around it.

Tenedos town, on the northeastern side of the island, at the foot of Mount Sana, is small, with a population of about 4,000. The houses are almost all built of wood and surrounded by gardens. It is defended by Ku Castle, a white fort, on which the Turkish flag flies. The town is of small commercial importance.

Water and small supplies of provisions may be obtained.

Port.—The little port of Tenedos can accommodate small vessels only. It is formed by a curve in the shore and a mole projecting 200 yards eastward from the peninsula of Ku Castle on the north, which shelters it from the northerly winds (*Tramontanes*), usually so violent in the archipelago. The depth gradually decreases from 6 fathoms at the entrance to 1 fathom near the beach at the head, and the bottom is sand and weed. A small vessel may find a berth just southward of the mole and as far in as her draft will admit.

Large vessels may anchor about ½ mile eastward of the mole head, in about 9 fathoms, sand and weed. This anchorage, though affording shelter from west, south, and southwesterly winds, is much exposed to north and northeasterly winds, and vessels should be prepared for the sudden shifts of wind to the northeast, which are frequent and dangerous in the winter. As the current nearly always runs to the southward, vessels rarely swing with their heads in that direction, even with a breeze from that quarter.

Trade.—The exports consist principally of wine and raisins.

Digitized by Google

Communication.—The town of Tenedos is a telegraph station. The Austrian Lloyd's steamers call once a fortnight and those of the Mahsûse Co. call occasionally.

Telegraph cables.—At about 200 yards southwest from the extremity of the southern point of Port Tenedos four telegraph cables are laid, two of which trend southward, passing about 300 yards from Oinos Point. One, after skirting the southeastern coast of Tenedos at about 200 yards distant, is connected with Lemnos, the other with Khios. Two cables are laid in an easterly direction for about 1 mile and thence between Gadaro Islet and Ocean Rock, one being continued in a north-northwesterly direction, passing about 1 mile westward of Praso Islet and thence northward and eastward into the Dardanelles at Chanak; the other is landed in a cove at the southern end of Bashika Bay. Vessels anchoring at Tenedos should avoid the neighborhood of these cables.

The best anchorage for naval vessels is in 12 fathoms, with Tar Point bearing 243° and Gadaro Lighthouse 353°.

Tenedos Channel.—Northward of Suffren Shoals, the passage between Tenedos and the mainland is wide and clear. The coast between Cape Eski Stambul and Yukyeri Point, forms an inward curve, where vessels when working to the northward will avoid the sea; but care should be taken not to stand too close to the shore, which is bordered all along at a distance of more than 700 yards, with shallow water. The depth in the channel is generally from 15 to 7 fathoms, and the nature of the bottom varies in different places.

Anchorage.—Vessels may anchor off any part of the coast in calm weather, but with fresh north or northwesterly winds it would be prudent to anchor in Yukyeri Bay, southward of the point of this name, at about ¾ mile from the shore, in 7 fathoms, mud and sand, with Gadaro Islet bearing about 299° and Yukyeri Point bearing 356°, or if necessary a little farther in.

Abreast of this roadstead is a vast forest of oak trees, the timber of which is used for shipbuilding. In the neighborhood of Alexandria Troas is the stunted oak which produces the valonea, the kernel of which is cooked and eaten and the shell used for tanning and dyeing.

Current.—The current in Tenedos Channel sets to the southward from 1½ to 2 knots an hour. With moderate north to north-northeasterly winds the velocity is about checked.

Yukyeri Shoals.—Yukyeri is a low salient point, and between it and Tenedos Mole the distance is 2¾ miles; but the channel is narrowed by Yukyeri Shoals, Ocean Rock, and Gadaro Islet, with passages between them. Yukyeri Shoals, which entirely surround Yukyeri Point, are composed of sand and rock, with from 4 to 2 fathoms water on them, and extend 1 mile north and south and the

Digitized by Google

same distance to the westward. Petro Islet in range with Gararo Islet, bearing 293°, leads southward of Yukyeri Shoals.

Ocean Rock.—This rock lies 1.3 miles 283° from Yukyeri Point; it has 2¾ fathoms on it and 3 and 4 fathoms at the distance of 300 yards on a sandy bank all round it. The edge of this bank is only 300 yards from that of Yukyeri Shoals, and in the narrow channel between there are 5½ to 7 fathoms water; at about ½ mile southeastward of Ocean Rock there are shoal patches of 5 fathoms.

This channel is not recommended, from the difficulty of recognizing the edges of the banks on either side, but a vessel of light draft using it should keep the southeastern end of Tenedos Island bearing about 210°. The three mills at the southern end of the town of Tenedos, in range with the northwestern side of Gadaro Islet, bearing 241°, or open northward of it, lead northward of Ocean Rock and Yukyeri Shoals.

Gadaro Islet and Little Gadaro are about 200 yards apart, and lie on a rocky shoal 650 yards in length east and west; both have a red appearance. Gadaro, the larger and easternmost, is nearly circular, 150 yards in diameter, and about 30 feet high, with a lighthouse on it. Gadaro Islet is 1,800 yards from Tenedos Mole and nearly 2 miles westward of Yukyeri Point; between the shoal surrounding it and that of Ocean Rock is a passage 700 yards wide and from 10 to 5½ fathoms deep.

Little Gadaro is a mere rock, and the channel between it and Tenedos is 1,500 yards wide and from 12 to 8 fathoms deep, the bottom being sand and weed.

Light.—A fixed white light, showing a red flash, is exhibited, at an elevation of 59 feet, from a white iron tower, 29 feet high, on Gadaro Islet; it is visible 13 miles, but is partly obscured by Tenedos Island. (See Light List.)

Bashika Bay.—From Yukyeri Point the coast trends northward a little easterly 4½ miles to Paleo Kastro or Bashika Point, and is for the greater part cliffy and backed by hilly land. Bashika Bay is formed by a curve in the coast southward of the latter point, and for 1¼ miles in that direction the shore is low with a marshy plain within it, and bordered by shallow water, which, at about 700 yards southward of Paleo Kastro, extends off 800 yards. Tree Peak (northern side of Dardanelles Entrance) in range with Demetrios Point tumulus, bearing 25°, leads westward of the shoal ground off Bashika Point.

Telegraph cable.—The telegraph cable from the town of Tenedos is landed on a beach 1.9 miles northward of Yukyeri Point; the landing place near the cable house is indicated by a stone pillar. Vessels should avoid anchoring near the cable.

Paleo Kastro, or Bashika Point (on which are remains of the old castle only a few feet above the ground) is a small rounded bluff, with the upper edge of the cliff 30 yards within the base, which is

Digitized by Google

fringed all round at a distance of 25 yards by a rocky ledge and large bowlders. From the inner edge of the bluff Paleo Kastro slopes down gradually to the eastward or land side for about 100 yards, where it forms a dip or valley, with a spur from Bashik Tepe.

Bashik Tepe, an artificial conical mound nearly ½ mile northeastward of Paleo Kastro, is a good mark; Ujek Tepe, another artificial conical mound or tumulus 284 feet high nearly 1¾ miles eastward of the head of the bay, is also conspicuous. The hilly land west-southwestward of Ujek Tepe terminates at the sea in white cliffs, with sandy beach between them. A white stone house with a red roof stands close to the shore just northward of the northern white cliff, and at about 400 yards southward of the house is a large earthwork battery. A third of a mile southward of this battery and close to the shore is situated a building known as the Admiralty Picket House.

Anchorage.—Bashika Bay is considered a safe summer anchorage, but the holding ground in some places is uncertain, and as several naval vessels have dragged their anchors during winds both from north-northeast and south-southwest, great attention is required when lying here. Vessels may anchor where convenient, but a berth recommended is in 10 or 11 fathoms water, mud bottom, with Seddul Bahr or European Castle just open of Paleo Kastro, Ujek Tepe or tumulus on the plain open northward of the white cliffs about 80°, the southwestern extremity of Phido Islet about 300°, and Gadaro Lighthouse 215° about ¾ mile from the shore. Small vessels may obtain shelter from northerly winds by anchoring in 5 or 6 fathoms, distant 600 yards from the shore. The water is sufficiently clear at times to admit of the chain being seen on the bottom in a depth of 8 or 9 fathoms.

The bay is a good place for boat sailing, for, though the wind is often high, there is not generally too much swell or current.

Snipe are to be shot in great numbers after August, fine cock after November, following north or northeasterly winds, and in the cover round the cultivated patches; hares are also abundant, and large duck and geese also come in with the hard weather. A northeasterly gale in December, 1876, brought in a large flight of woodcock.

Current.—In the outer part of Bashika Bay the current at times runs to the southward at the rate of 1½ and occasionally 2 knots an hour, but its strength is less inshore, and occasionally an eddy sets to the northward. It is much influenced by the force and direction of the wind.

Winds—Gales.—Strong gales from the west and northwestward are not of long duration, and during a gale from the westward, in December, 1849, the British naval vessel *Caledonia* experienced an undertow setting from the shore which caused the vessel to ride without much strain on her cables.

Digitized by Google

The worst gales are from the northeast; southerly gales often blow with violence, but the anchorage is partially sheltered from the latter by the island of Tenedos, and they usually terminate by shifting to the west-northwest and northwest. During the months of June to October 1853, the wind prevailed from the northeast and was usually moderate enough for boats to water. Capt. Bowden Smith, of the British naval vessel Hercules in 1876 writes:

"For the first two days after our arrival at Bashika we had a fresh breeze from the southwest, but on May 29 it commenced to blow hard from north and north-northeast, and from early in June till September 9 the strong breezes were nearly always from the north-northeast. These winds, though fresh and sometimes fiery during the day, usually went down in the evening, the nights being generally calm.

"Thunderstorms and the usual Mediterranean squalls were experienced during the months of June and July. For the greater part of October and the first part of November the prevailing winds were still northerly, but from November 27 to December 22 there was a great prevalence of southerly winds and mild weather, and on the last-named day, and also on the 23d, it blew a gale from south-southwest. During this gale the *Triumph* dragged her anchor three times, though having 100 fathoms of cable out; it was thought the anchor could not have bitten properly ere the gale commenced.

"On December 27, after a day's light wind with rain, it commenced to blow from the northeast, which freshened to a heavy gale with violent squalls, and lasted three days. Although the force of the wind was quite 10 in the squalls, the sea was not heavy, and the ships rode it out well with two anchors down and steam up. Snow fell on the 28th, but afterwards the weather became mild. Though the breezes were usually stronger from the northeast than from the south-southwest, the latter caused a more unpleasant sea for landing.

"As strong winds from west or northwest were not experienced, I can not say how vessels would ride out a breeze from that exposed quarter, but my own impression is they would not suffer, and wind from these points of the compass is said to be rare.

"**Climate.**—The climate during the summer has been all that could be wished for; though the sun during the day was powerful, the heat was never oppressive, and the nights always cool and fresh. No bad effects have been felt from the large marsh in the neighborhood, and the health of the men has been excellent. This may partly be attributed to the entire use of distilled water, as the British fleet at Bashika in 1853 suffered severly from fever. There was a marked difference in the temperature at Kavala, or places on that shore, where we found the nights oppressively hot, while at Bashika it would be comparatively cool.

"**Water** may be obtained from the river which runs into the northeastern part of the bay; with favorable weather, an engine, and a suffi-

Digitized by Google

cient length of hose, 30 tons a day can be obtained, but the approach to the beach is shallow, and watering with boats, which have to lie a long way out, is irksome and tedious, besides the risk of fever. On the arrival of the British fleet in 1876 water was procured from the river, but afterwards, owing to impurities which got into it, recourse was had to condensing."

Supplies of fresh meat, bread, and vegetables can be obtained at Bashika Bay.

Rabbit Islands (ancient Lagussœ), called by the Turks Tacohan Adasi, are a group of four islands or islets, with several shoal rocky patches around them, extending over a distance of about 3¼ miles in a northwest and southeasterly direction. Phido, the southeastern islet, is nearly 3 miles from Paleo Kastro, the nearest point of the coast, and the passage between the islands and the shoals bordering the north coast of Tenedos is rather less than 4 miles.

Mavro, the largest of the group, is 1 mile in length east and west and 800 yards in breadth, with its highest part at the western end, where it is cliffy; the island is surrounded by shoal water to a distance of from 200 to 300 yards.

Praso Islet, about 300 yards in extent, is low, and lies ¼ mile off the southwestern end of Mavro, to which it is connected by a reef or line of breakers; on the reef between is a large rock named Mikro.

Rock southward.—A rocky shoal, about 200 yards in extent, with a least depth of 4¼ fathoms, has been discovered 1,140 yards 123° from the northeastern point of Praso Island.

Smith Shoal lies 550 yards 288° 30′ from Praso Islet. The shoal is 200 yards in length north and south, with 3 fathoms of water on it and 8 fathoms between it and the shoal water bordering Praso.

Drepano and **Phido**, the two southernmost islets, lie on a rocky bank upward of 1 mile in length east and west, the former islet near the western and the latter near the eastern end of the bank. The bank extends 300 yards eastward of Phido, and a spit extends 700 yards westward of Drepano. The northern edge of the ruined village of Yeni shehr bearing 54°, and just open of Mavro Island, lead westward of the spit.

Note.—This range mark leads nearly over the 4¼-fathom rock, southward of Mavro, mentioned above.

The passage between the 5-fathom curve around these islets and that of Mavro is nearly ½ mile wide and 9 to 6 fathoms deep, but there is a rock with 4¼ fathoms over it nearly in mid-channel.

Anchorage.—A vessel may anchor in any part of this passage for shelter during northerly winds. In order to keep as near as possible a mid-channel course, the southernmost part of Yeni Kioi village should be kept in range with a peaked hill in the interior, bearing 84° 30′.

Current.—The current sets through to the westward.

Digitized by Google

Aldridge Rock, with 5 fathoms water on it, lies ½ mile 117° from the northeastern side of Phido Islet.

Aird Shoals.—The shoals bordering the northern coast of Mavro extend off upward of 1 mile from that island. The northern portion is composed of patches of hard sand, interspersed with rocks having from ½ to 4 fathoms of water on them, and are called Aird Shoals. These shoals are separated from the shallow water fringing the shore of Mavro by a narrow passage carrying 4½ to 5 fathoms water over rocky bottom.

The western end of Gadaro Islet in range with the eastern end of Phido Islet bearing 176° leads eastward of Aird Shoals.

The current here sets strongly to the southwestward.

Mansell Shoal.—This is an irregularly shaped shoal, 800 yards westward of the Aird Shoals and more than ¾ mile in diameter, with general depths of 5 and 4 fathoms, but only 3 fathoms near the central part and northern end. The patch at the northern extremity bears 342° 1.1 miles from the western end of Mavro Island. Between this shoal and Aird Shoals there are from 6 to 10 fathoms, and between its southern end and the bank from Mavro, which are 300 yards apart, there are 5½ and 7 fathoms.

The eastern extremity of Tenedos Island open westward of Praso Islet, bearing 168°, leads westward of Mansell Shoal.

Loney Bank is about ¼ mile in length east and west and has from 9 to 7 fathoms water on it. The least depth lies with the eastern end of Mavro bearing 194°, 2.3 miles, and in range with the western end of Drepano Islet.

Coast.—From Paleo Kastro the shore trends in a north-northeast direction for 4¾ miles to Cape Yeni Shehr and then turns northeastward about 1¼ miles to Kum Kale, or New Castle of Asia, on the southern side of entrance to the Dardanelles. The cliffy coast is bordered by sand and rocks, on which it is difficult to land. At 1½ miles northward of Paleo Kastro is the village of Yeni Kioi, on a hill 180 feet high, and 1¼ miles farther north and close to the coast is a tumulus 210 feet high. At 1½ miles farther on and close to Cape Yeni Shehr is the village of that name, now in ruins. The plain of Troy lies eastward of this part of the coast.

Cape Yeni Shehr (ancient *Sigeum prom.*) is known by a hill about 230 feet high with a large house on its summit, and also nine mills, to the southward of which is the village. The cape springs from high land steep toward the sea, but terminates in a low point. Northeastward and a short distance inland two tumuli are conspicuous. These are said to be the tombs of Achilles and Patroclus.

Yeni Shehr Bank.—The shallow water which surrounds Paleo Kastro continues along the coast to the northward, in places extending off nearly ¼ mile, and at 1 mile southward of Cape Yeni Shehr the bank of this name, with from 2½ to 4½ fathoms water on it, extends

Digitized by Google

off ¾ mile. Off Cape Yeni Shehr itself the distance to the edge of the 5-fathom curve is 1,200 yards, whence this depth of water gradually approaches nearer the coast to Kum Kale, where the depth of 5 fathoms will be found 300 yards off.

Between Cape Yeni Shehr and Kum Kale the 1-fathom curve extends a long way from the shore, viz, ¼ mile from the cape and ½ mile from the shore 800 yards northeastward of the cape; from thence the edge of this 1-fathom bank runs nearly straight to the extremity of Kum Kale. The bank was reported to be extending in 1906.

Anchorage.—To the southward of Yeni Shehr Bank there is anchorage much used by tugs or by vessels waiting for a fair wind. The best berth is in 12 fathoms, with Cape Yeni Shehr bearing 38° and the tumulus on Demetrios Point bearing 142°.

Kum Kale is an old stone castle originally designed for 200 guns but has now only about 25 in a battery at the water line, and is in a ruinous condition, with a few indifferent houses near it. This castle, with Seddul Bahr on the European side, is supposed to command the entrance to the Dardanelles, which is 2 miles wide.

Lights.—On the northwestern angle of Kum Kale a flashing red light is exhibited at 29 feet above the sea; the light is shown from a staff on a white house, and is visible 6 miles. (See Light List.)

Directions.—Approaching the Dardanelles from the southwestward the island of Tenedos will be first sighted, and by day at a distance of upward of 30 miles; at night the light on Ponente Point, the western end of the island, will be seen. A vessel may steer so as to pass westward of the island through the Lemnos Channel, or between it and the coast of Asia, known as the Tenedos Channel. As the Dardanelles is approached the current will be forcibly felt, and at times it runs with such strength as to oblige sailing vessels to anchor in light winds.

The distance between Tenedos and the Kharos Bank, off the eastern side of Lemnos, is about 13 miles, and in order to avoid the bank a sailing vessel working to windward should tack short of a line passing through Cape Irene (the southeastern point of Lemnos) and Cape Kephalo (the eastern extremity of Imbros Island), bearing about 55° and 235° of each other. The bank, when in its vicinity, will probably be recognized during day by the discolored water; it may also be avoided by not passing westward of the meridian of the western end of Imbros. At night Tenedos Light should be kept well in sight from the deck.

To the southward of Kharos Bank the current sets northward about ¼ mile an hour.

In standing toward Shimal Bank, at the northwestern end of Tenedos, tack before the northern edge of the ruined village of Yeni Chehr come open of the southeastern end of Mavro Island. Having weathered Shimal Bank, a vessel may seek an anchorage under

Digitized by Google

Mavro Island, or off the mainland. In passing between Tenedos and the Rabbit Islands keep on the northern side of the channel, as the current sets to the west-southwestward toward Shimal Rock. Petro Islet bearing southward 122°, with Gadaro Islet open three times its length to the eastward, will clear Shimal Rock.

The eastern extremity of Tenedos Island kept bearing eastward of 159° will lead westward of Smith Shoal. When northward of Smith Shoal, the eastern extremity of Tenedos Island, open westward of Praso Islet, bearing 168°, will lead westward of Mansell Shoal. When passing northward of Mavro Island it will be prudent, in consequence of the strength and uncertainty of the currents, to give the island and its shoals a wide berth. The Tumulus, 210 feet high, over Demetrios Point, northward of the village of Yeni Kioi, bearing 106° and in range with a peak inland, leads well northward of Mansell and Aird Shoals; it should be observed that this mark also leads over Loney Bank.

Short tacks should be made northward of the influence of the current, or near the southern side of Imbros Island, where north-easterly winds generally draw more to the northward and where the shore is free from danger outside the distance of 1 mile, until the vessel on the port tack can fetch Cape Helles.

If in light winds the strength of the current should render it actually necessary, anchorage may be obtained southward of Imbros.

Tenedos Channel is generally used by vessels coming from the southward, the only danger on entering being Suffren Shoals, bordering Cape Eski Stambul, which should be given a wide berth. When northward of these shoals steer for Gadaro Islet, and if it is intended to pass between it and Ocean Rock give the islet a berth of ¼ mile, and when the three mills at the southern end of the town of Tenedos open northward of Gadaro (the mark leading northward of Ocean Rock and Yukyeri Shoals) steer as convenient to the northward.

The passage most frequented is between Little Gadaro and Tenedos Mole; it is 1,400 yards in breadth, from 11 to 7 fathoms deep, free from danger, and easy of access. When working to the northward the shoal extending from Paleo Kastro should be given a wide berth, and Phido Islet should not be approached in a vessel of heavy draft nearer than 1 mile, so as to avoid Aldridge Rock. To clear Aird Shoals, northward of Mavro, keep Gadaro Islet open eastward of Phido Islet bearing 176°.

Continuing northward, keep outside of Yeni Shehr Bank, and alter course gradually, so as to give Kum Kale Point a berth of 400 yards, taking care in running along the edge of the bank not to go into less than 10 fathoms, as the water shoals rapidly.

Continue on, with Cape Helles Lighthouse bearing 16°, until the large village of Aren Kioi or Ghelmez, on the side of a hill, comes

Digitized by Google

open northward of Kum Kale, bearing 84°, when the course may be altered northeastward.

At night the bearings of Ponente Point, Gadaro Islet, and Cape Helles Lights will indicate a vessel's position.

Cape Helles Light should not be brought northward of 14° until Kum Kale Light bears southward of 91° 30′.

Regulations for navigation.—The following regulations have been issued for the guidance of masters of vessels passing through the Dardanelles, and conducted by a pilot vessel:

1. The firman launch is situated between Nagara and Bokali Kalessi Lighthouses; the firman will be issued there.

2. Vessels which are not provided with a firman must not cross the line between the above-mentioned lighthouses.

3. All vessels must hug the European shore and keep clear of the Asiatic shore of the strait.

4. All vessels, whether inward or outward bound, must pass as close as possible to a buoy marking a shoal near Kilid Bahr Lighthouse.

5. Any vessel which sees that the vessel next ahead of her is deviated from her course by the current must avoid following her, and keep a proper course.

6. All vessels outward bound, wishing to call at Chanak (Dardanelles), must, when leaving, proceed to Maitos to meet the pilot vessel. Vessels inward bound, wishing to call at Chanak (Dardanelles), must first proceed to Maitos, maintaining their position in the line, and will proceed from thence to Chanak.

7. Vessels bound for Constantinople are absolutely prohibited from stopping near the buoys; they must wait off Khelia Liman to obtain pratique.

Caution with regard to mines.—Mariners are informed that mines still exist in this neighborhood, and great caution should be exercised when approaching or leaving the ports.

Anchorages.—A vessel may anchor anywhere eastward of Tenedos and the Rabbit Islands during a calm, and no one should hesitate to anchor in mid-channel to prevent the vessel drifting with the current, but with a fresh wind from the northward it is best to anchor in Bashika or Yukyeri Bays.

Current.—Northward of Rabbit Islands and between them and Tenedos the current sets west-southwestward. Eastward of Rabbit Islands and Tenedos the current sets southward with a velocity of 1½ to 2 knots per hour. Northward of Rabbit Islands the velocity is about 2½ knots per hour.

When approaching the Dardanelles from the southwestward, the northern side of the entrance will be identified by the white cliffs of Cape Helles, on which is a conspicuous white stone lighthouse. On

Digitized by Google

the southern side of the entrance are the cliffs of Sigeum, and northward of them the hill of Yeni Shehr, also steep and cliffy. Another conspicuous mark on the European side is Tree Peak, 730 feet above the sea and nearly 5 miles northeastward of Cape Helles; it makes as an isolated conical peak with a large tree on its summit.

On a nearer approach the villages of Yeni Shehr and Seddul Bahr will be perceived on their respective sides of the entrance; only a few houses of the former will be seen while the vessel is to the southward, but on bringing it to bear northeasterly the houses will open out. The castle of Kum Kale will also be seen on a low point which stretches from the hill of Yeni Shehr northward.

Seddul Bahr is on the northern side of the strait, and stands on the slope of the hill forming Cape Greco, 1,200 yards eastward of Cape Helles. Here is one of the old stone fortresses which gives its name to the town, and its great size and the low but massive towers at the angles of the castle render it a conspicuous object. When these two towers can be distinguished the entrance of the Dardanelles will be plainly open.

Cape Helles.—This cape, on the northern side of the entrance to the Dardanelles, is the central of three high, steep, white cliffs, together forming a headland projecting to the southwestward 1.3 miles in breadth. Cape Tekeh, the northwestern extremity, is the ancient *Mastusium* Promontory, and has a building on it. On Cape Helles are some ruins, a tomb said to be that of Protesilas, and a white stone lighthouse. On Cape Greco, the southeastern extremity, is the castle of Seddul Bahr, which, with that of Kum Kale, defends the entrance of the straits. Though this headland is steep, the shore is bordered by shallow water, and rocks and sand extend from the cape 300 yards.

Light.—The white stone lighthouse on Cape Helles is 33 feet high, and exhibits at an elevation of 98 feet above the sea a flashing white light. The light is visible 16 miles. (See Light List.)

Anchorage.—Vessels sometimes anchor between Capes Helles and Seddul Bahr to await a fair wind, but it is a bad anchorage. The best berth is in 7 fathoms, sandy bottom, at 800 yards from the shore, with the southern angle of the castle bearing about 75°, and the fort on the height 46° 30′.

Seddul Bahr Castle (Barrier of the Sea) is a quadrangular inclosure with solid walls and low towers at the angles. It stands on the side of the hill which slopes to Cape Greco, with its lower wall at the water's edge. It is the largest fortress in acreage in the Dardanelles. On the height behind the castle is a fort named Shahim Kalessi.

The small town of Seddul Bahr stands on a hill eastward of the castle, and is one of the pratique posts for coasting vessels proceeding

Digitized by Google

to Constantinople, and very convenient, as a vessel can keep out of the current under the lee of the cape, while her boat communicates.

Light.—On the southern point of the fortress of Seddul Bahr, Cape Greco, is a white house, with a white iron framework, 24 feet in height. From this structure is shown a flashing green light, at an elevation of 36 feet above the sea, and visible 5 miles. (See Light List.)

The above lights on the north, with that of Kum Kale on the south, mark the entrance of the Dardanelles at night. (See Light List.)

Pratique.—The sanitary condition of vessels from the Mediterranean bound to or beyond Constantinople is inquired into at Chanak Kalessi. (For regulations relating thereto, and for passing through the Dardanelles, see Black Sea Pilot.)

Aqueduct.—Northeastward of Seddul Bahr, about 700 yards from the shore of Morto Bay, are five hydrants of an aqueduct, having the appearance of square pillars.

Morto Bay.—At 1½ miles eastward of Seddul Bahr is another bold steep white point, named Eski Hisarlik, with the ruins of De Tott's Battery on it. Between the two is Morto Bay, about ½ mile deep, with a sandy shore, except near its extremities.

Rocky bank.—Morto Bay is almost filled by shoals of sand and rock. One, continuing around Seddul Bahr, extends from the shore farther eastward to a distance of ½ mile, when its edge turns in toward the head of the bay; the eastern side of the bay is also bordered by a similar shoal, but not so extensive.

Nearly in the center of the bay, in the narrow space between the two shoals, there is indifferent anchorage. The current runs across the mouth of the bay with great velocity.

Buoy.—The eastern extremity of the rocky bank on the western side of entrance to Morto Bay is marked by a red buoy moored in 6 fathoms water. Close westward of the buoy there are only 3 fathoms water. The position and color of the buoy can not be relied upon.

Anchorage in Morto Bay.—To enter Morto Bay bring the western hydrant to bear 322°, and steer for it till about 400 yards past the buoy, then anchor in 14 fathoms, at about ½ mile 266° from Eski Hisarlik Point. Morto Bay will be found a convenient anchorage for steamers entering the strait just before sunset, but there is very little swinging room in it.

Directions for sailing vessels.—Vessels under sail entering the Dardanelles during northeast and northerly winds should close with Cape Helles on the port tack, round Seddul Bahr at the distance of 600 yards, and after passing Morto Bay stand over close hauled into Aren Kioi Bay on the Asiatic shore, and there work up in the eddy, taking care to tack short of the edge of the main current, which may be distinctly seen, and is usually about 1½ miles from the Aren Kioi shore.

Digitized by Google

When entering the Dardanelles with a northwesterly wind keep the European shore aboard, and a vessel will thus be able to gain the anchorage westward of Seddul Bahr.

Caution.—Be prepared for squalls from off the land.

Current.—Between Kum Kale and Seddul Bahr the current runs west-southwest at the average rate of 1½ knots, the maximum being about 3 knots. The current is stronger on the Asiatic side and rushes along the edge of Yeni Shehr Bank with great velocity.

(For description of coast farther east, see Black Sea Pilot.)

Imbros Island.—This island is about 16 miles in length east and west, nearly 7 miles in breadth, mountainous, rising in its loftiest peak (Mount Elias near the center) to the height of 1,959 feet. It is well wooded, intersected with fertile valleys, abounding in game, chiefly hares and partridges, and produces wine, oil, cotton, and lead. It contains several villages. The population of the island is about 9,000, mostly Greeks.

Cape Kephalo.—The southeastern portion of Imbros, though much lower than the lofty land behind it, is still about 100 feet high, and stretches out flat at that height from the isthmus at the head of the large bay west of Cape Kephalo. The cape is surrounded by rocks, which project nearly ¼ mile northward.

Bank.—This end of the island is bordered by a bank with from 9 to 6 fathoms water on it extending 1¾ miles from the shore at that distance wouthwestward of the cape. The eastern edge of the bank is 1 mile and the northern about ½ mile from Cape Kephalo. This portion of the coast has a shallower fringe extending about 700 yards.

Kephalo Bay temporary anchorage.—This bay situated southwestward of Cape Kephalo affords temporary anchoring depths in from 5 to 10 fathoms, fine sand, but when anchoring here in case of actual necessity during a southerly gale the usual precaution is necessary, as the wind generally shifts suddenly and with violence to the northwest.

Caution.—With the exception of Lemnos and the entrance to the Dardanelles, the surveys on which H. O. Chart No. 3,968 is founded are imperfect.

Light.—On Cape Kephalo are exhibited two fixed white lights, placed vertically, the upper light being elevated 128 feet above the level of the sea, and visible 10 miles. The lights are shown from a mast erected over a large white dwelling with a red roof. (See Light List.)

Cape Aliki.—At 3 miles southwestward of Cape Kephalo is a small cliffy point named Cape Aliki, with shoal water extending from it more than ¼ mile, and at 1¼ miles farther westward rocks covered and uncovered project ½ mile southward.

South coast.—Within Cape Aliki is a lake about 1¼ miles in length. Vessels often take shelter from northerly winds by an-

Digitized by Google

choring near the cape, abreast the lake. The British naval vessel *Devastation*, in October, 1877, anchored southward of the lake, in 9 fathoms water, with the point of land to the eastward bearing 72°, and a house with a red roof near the shore 340°. The red-roofed house is conspicuous from a distance, stands on a slightly elevated piece of land, and is the only building near. The British naval vessel *Surprise* anchored near here in 1904 in 6 fathoms, with cape Aliki bearing 63° and the red-roofed house 323°; from this position the water shoaled gradually to the shore. The mill, which stands on a slight elevation at the back of the lake, kept on a 17° bearing, is a good range mark into the center of the bay. Large vessels should not go into a less depth than 9 fathoms.

Water in small quantities may be obtained by digging in the sand close to the beach, a little westward; about 6 miles westward of Cape Aliki it may be obtained in any quantity.

The western part of the south coast of Imbros Island should be approached with caution, as there are one or two detached shoals and shallow water bordering the shore.

The British naval vessels *Bacchante*, *Lancaster*, and *Suffolk* anchored to southward of lake near Cape Aliki, in 10 fathoms of water, with Cape Aliki bearing 31°, 6-foot rock, 291°, and point in range with Coja Chemen Dogh, 61°. From this position the house with red roof was shut out by the higher land near Cape Aliki.

Anchorage will be found about 2¼ miles westward of Cape Niger, in 16 fathoms water, good stiff holding ground, with Capes Niger and Aliki in range bearing about 76°, the eastern point of the bay 58°, and Avlaka Point shut well in behind the west point of the bay and most southerly point of the island, the latter bearing 282°. There is also anchorage eastward of Avlaka Point, taking care to avoid the bank stretching off 1,400 yards from the shore 2 miles from the cape. The edge of the bank at the depth of 3 fathoms bears 122° 30′, and is distant nearly 2 miles from the cape.

British naval vessels have also anchored in 10 fathoms of water, with Cape Aliki bearing 31° distant about 1,600 yards, and the salient point eastward of it in range with Coja chemen dagh (Gallipoli) bearing 61°. From this position the house with red roof was shut out by the higher land near Cape Aliki.

Avlaka Point, the western extremity of the island, is about 11 miles 63° 30′ from Cape Plaka of Lemnos, and the passage between is clear and deep.

Currents.—The currents round the western end of Imbros are variable; a strong current has been found setting eastward along the south coast.

North coast.—The north coast of Imbros appears to be clear of danger, but to afford no anchorage, being very steep-to everywhere.

Digitized by Google

Samothraki.—This island (ancient Dardania) is 12 miles in length east and west, nearly 7 miles in extreme breadth, and somewhat oval in shape. Mount Fengari, near the center, is 5,248 feet above the sea, a greater elevation than on any of the islands in the archipelago excepting Mount Delphi of Eubœa and the Madara Vuna of Crete. The coast of Samothraki is regular, skirted here and there close-to by rocks. It has no port or roadstead, but occasionally anchorage may be found on its southwestern side. The island produces corn, oil, honey, and wax; it also feeds a large number of goats. The population is about 4,600, nearly all Greeks.

Communication.—The only communication is by caique with Dedeagatch, Thaso, and Imbros Islands.

Cape Akrotiri, the low northwestern point of Samothraki, which is almost level with the sea, extends 1½ miles from the general line of the coast.

At night too much caution can not be observed when in its vicinity, as the proximity of the highland renders any judgment of distance doubtful.

Zurafa Rock.—At about 6¼ miles eastward of Skepasto point, the northeastern extremity of Samothraki, is a dangerous ledge named Zurafa Rock, about 100 feet in length, of which the most part is nearly awash, but in two places, some 50 feet apart, it is dry. At the west end, the highest point of the rock, a small sharp head is about 2 or 3 feet out of water. The other part exposed is a flat surface in the center of the rock, about 1 foot only above the level of the sea.

When this rock was examined by Capt. Wharton in the British surveying vessel *Fawn*, in 1880, there was too much sea to land or to sound close to it, but apparently the rock is fairly steep-to on all sides. It rises from a small bank of soundings. At 200 yards northward of the rock there are 16 fathoms. To the westward the bank extends farther, as 11 and 14 fathoms were carried in that direction for about 800 yards from the rock, when the water deepened. With a moderate southwesterly wind and short sea the break on Zurafa Rock was visible from the deck when 4 miles distant.

Current.—The current here has been observed to set eastward 2 knots an hour.

Cape Suvla, on the mainland, is the western termination of Kislar Dagh, a ridge about 300 feet high on the southern side of the entrance to the Gulf of Xeros. The cape bears about 7°, 15½ miles from Cape Tekeh, at the entrance to the Dardanelles. The coast between, forming an indentation 3½ miles deep, consists at first of cliffs and then of sand, backed by hills in the interior varying from 230 to 950 feet high.

Shoal.—Off the mouth of the brook Chana Ovasi, situated nearly midway between Cape Tekeh and Suvla Bay, a bank with from 2 to 4 fathoms on it extends more than ½ mile from the shore.

Digitized by Google

Suvla Bay or Little Hanafart.—On the southern side of Cape Suvla is a semicircular bay of the same name, called also Little Hanafart, 1¾ miles wide between Cape Suvla and Niebruniessi Point, and 1 mile deep, with 12 to 5 fathoms water, sandy bottom; it forms a good summer anchorage, affording shelter from northerly, easterly, and southerly winds. The shore is bordered at a distance of 400 to 600 yards by shallow water and rocks, and both horns of the bay are foul, the rocks extending 300 yards from Cape Suvla. Within the south part of the bay is a large shallow salt water lake communicating with the sea; it is nearly dry in summer and overgrown with rushes.

Landing places.—The south landing place is situated 200 yards southward of the entrance to the salt lake, and the other two are one on each side of a rocky point on the north shore of the bay, 1,800 yards eastward from Cape Suvla.

Coast.—The shore southward of Niebruniessi Point is a shelving beach of hard sand admirably adapted for landing, and has a cultivated plain behind it. The watercourses are dry in summer, but there are wells and springs of good water at distant intervals. The country around seems fertile, and numerous herds of cattle, goats, etc., feed on the plain. At about 1 mile inland a tolerable road leads to the village of Kuchuk Hanafart, and and thence a good road leads to Gallipoli.

The Gulf of Xeros is 17 miles wide at the entrance between Cape Suvla on the south and Cape Gremea on the north; thence the gulf extends 31½ miles eastward, between mountainous land on either side, to the low shore at its head, and has no off-lying hidden danger.

Kishlar Rocks.—At 2½ miles northeastward of Cape Suvla and ½ mile from the shore is the center of a bed of rocks. These rocks extend ½ mile east and west, are above and below water and steep-to, the 100-fathom curve soundings passing about 400 yards outside them.

Arapos Mermedia Bay.—This little bay (Ejelmar), 5¾ miles northeastward of Cape Suvla, is 1,400 yards wide between East and West Capes (180 feet and 280 feet high, respectively), 700 yards deep, with from 9 to 5 fathoms water. The holding ground is good, being thick black mud, but the bottom near the shore, especially under the cliffs, is foul. The head of the bay consists of about ½ mile of clear beach, generally admitting a vessel's launch to go close in. A tolerably good road leads into the interior, and between the hills within is a large plain.

Shoals.—Shallow rocks lie 50 yards from the north part of each cape. A rock with ½ fathom of water on it lies 150 yards from the point just westward of the Kurtumus Dere. A ledge of rocks, over which there are from 2 to 3 fathoms water, extends in a 288° direction 300 yards from the eastern shore, 600 yards from East Cape. In

Digitized by Google

addition to these dangers, the irregular 3-fathom curve follows the shore of the bay around at an average distance of 200 yards.

Anchorage.—The best anchorage is in about 8 fathoms of water, with West Cape bearing 293° distant 600 yards, and about 300 yards from the shore.

Good water may be obtained from the Kurtumus Dere that runs into the bay through a cultivated valley, and wood is plentiful.

Coast.—From Arapos Mermedia Bay east-northeastward to Pasha Dere, a small jagged rock 16 feet high, close to the shore, the distance is nearly 12 miles, the water being all along deep. Pasha Dere is foul, and 400 yards outside it there are only 5 fathoms of water. At less than 1 mile within the coast is a range of mountains varying from 1,000 to 1,478 feet high. A projecting point 4¼ miles east-northeastward of Pasha Dere has rocks off it at the distance of about 200 yards; at nearly ¾ mile westward of the point and ¼ mile from the shore is a shoal with 2½ fathoms on it. Yeni-kioi, a town on a hill 748 feet high, with some windmills near it, is over 1 mile from the sea and 2¼ miles southwestward of the point alluded to.

Current.—On the western coast of the Gallipoli Peninsula the usual set of the current is to the north-northwestward, at about 1½ miles per hour. It is, however, much influenced by the prevailing wind.

Yenikli Liman, a bay 3¾ miles farther eastward, will be known by its red cliffs; here is the narrowest part of the Gallipoli Peninsula.

Between Yenikli Liman and Cape Xeros, 2¾ miles northeastward, the coast consists of irregular cliffs from 50 to 200 feet high, but which are broken nearly midway by low marshy land; the cliffs are skirted close-to by rocks.

Cape Xeros is the termination of Baklar Burnu, a projecting tongue of land forming the western side of a bay named Port Baklar and on it are the remains of an old mud fort, about 50 feet above the sea; the cape is surrounded by rocks which project about 100 yards.

Port Baklar is filled with extensive shoals, the whole shore being skirted here and there by rocks, and ½ mile southeastward of Cape Xeros shallow water extends off nearly that distance. A break or opening in the shoal ground, about 700 yards from the cape, affords anchorage space for small vessels in from 4 to 3¼ fathoms water, good holding ground. A small hill like a tumulus, 800 yards within the head of the port, bearing 205°, leads into the deepest water. An isolated patch with 3 fathoms on it lies close to this range mark and 800 yards 153° from Cape Xeros. Vessels of heavy draft having occasion to call at the port should anchor farther out.

Kavach River.—From Port Baklar the coast trends northeasterly to the head of the gulf, and at about 5 miles 52° from Cape Xeros is the mouth of Kavach River. The passage, having a depth of about 6 feet, is between two sand banks, and the river is navigable for boats

Digitized by Google

as far as the village of Kavach, distant about 2½ miles. Shoal water is reported to exist from 1 to 1½ miles 210° from the entrance. From Kavach River the coast trends northward and westward to Bustan Burnu, a point northward of Peros Island.

Shoal.—Between Bustan Burnu and a point 1,400 yards westward of it (also 400 yards eastward of a low point with a windmill on it) the shore is fronted by shallow water and broken uneven ground, which should be avoided, and at ½ mile off it between the two points is a rocky shoal awash, about 200 yards in length north and south. The shoal lies with the hummock of Mount Dohan Aslan appearing a little open of the western end of Xero Mikro, bearing 134° and distant from the latter 1¼ miles. To avoid the shoal keep nearer the islands than the main shore.

Water may be obtained from a small stream nearly 2 miles westward of the windmill just alluded to.

Xeros Islands.—Xeros, the largest of these three islands, lies 3½ miles northward of Cape Xeros and is about 700 yards in average diameter, with a tower and the ruins of a monastery on it. The island is cliffy, with rocks extending about 100 yards from its salient points.

Xero Mikro.—At 1,200 yards east-northeastward from Xeros Island is Xero Mikro, nearly ¼ mile in length. To the eastward of Xero Mikro, separated by a passage 300 yards wide and 6 to 10 fathoms deep, is Xero Skopelo; both these little islets are surrounded by rocks to a distance of about 100 yards.

Anchorage.—Between Xeros and Xero Mikro there is anchorage in 15 or 16 fathoms water, sand, and mud, and to the north and northeastward of Xero Mikro there is anchorage for any number of vessels in from 10 to 14 fathoms, good holding ground.

Xero Mikro is 1.4 miles from the north shore of the gulf, and with Xero Skopelo lies on the tail of a bank with from 6 to 8 fathoms water, uniting the two. The bank has from 10 to 14 fathoms on either side of it, and vessels should anchor northeastward of it.

Coast.—The shore westward of the Xeros Islands to Cape Ibriji, the only salient point on the northern side of the gulf, is bordered here and there by shallow water at the distance of nearly 400 yards. At Cape Ibriji shoal water extends off about 300 yards, and thence a narrow shoal continues along the shore westward to that of Cape Gremea, but there are no off-lying dangers. It is backed by hills and mountainous land in the interior. Approaching from Cape Gremea, Cape Ibriji makes like an island, and might possible be mistaken for Xeros Island. Between Bustan Burnu and Cape Ibriji is the village of Kadi Kioi, 1 mile inland.

Ibriji, a small narrow bay with 150 yards of sandy beach at its head and with deep water close inshore, situated 1,400 yards north-

Digitized by Google

eastward of Cape Ibriji, is a good landing place. It is intended to be used eventually as the port for the coal mines of Keshan, 15 to 16 miles inland.

The currents in the Gulf of Xeros are irregular and appear to be influenced by the wind; after a fresh northerly wind for a few hours a strong southerly set has been experienced, but directly the wind moderated the current ran strongly in the opposite direction. In the bight of the coast off Enos, northward of Cape Gremea, the currents are strong (2 or 3 knots an hour) and irregular.

Cape Gremea, the northern point of entrance to the Gulf of Xeros, is a rounded headland composed of low yellow cliffs. The actual cape, a yellow cliff, is separated from yellow cliffs on either side by low sandy beaches, that to the eastward being about 1 mile in length. It is difficult at first to distinguish the cape from the other cliffs, but it may be recognized by the sandy beaches on each side and by the fact that the cliff to the eastward is longer, has a cleaner face, and coming from the south shows two clefts close together appearing like the letter W. The monastery of Amygdhalia is conspicuous from off the cape.

Shoal.—The whole coast of Cape Gremea is bordered by a shallow bank, but a little northward of the cliffs and 5½ miles southward from the entrance to Lake Bori the bank, with 6 to 12 feet on it, extends off 1½ miles, narrowing gradually in width until 1 mile southward of the entrance, whence it widens again. Vessels southward of the cape should not stand in to less than 7 fathoms water; westward and northwestward of the cape, for at least 3 miles beyond the cliffs, a vessel should not stand into less than 12 fathoms, as the water shoals suddenly from 10 to 3 fathoms.

Caution.—As several vessels have grounded on the shoals north westward of the cape, and the current from the westward sets strongly over it, care should be taken when in its vicinity. The shore in this locality should be given a berth of at least 2½ miles. A good mark by day for clearing the shoals is to keep the town of Enos open of the bluff on the south side of the lake.

Lake Bori is 6 miles northward of the cliffs of Cape Gremea. The shore between is low and bordered by shoal water. The lake is irregular in shape, about 2 miles in extent, with from 3 to 6 feet of water. One of the mouths of the Maritza River (ancient Hebrus) opens into it, and another mouth disembogues a little northward of the entrance.

Enos.—On the southern side of Lake Bori is the town of Enos, with an old Genoese castle and a population of about 2,000, chiefly Greeks. Enos is the port of Adrianople, with which it has some trade in corn, wool, camel's hair, cotton, leather, saffron, silk, wax, and copper. It is distant from Adrianople about 70 miles, and has

Digitized by Google

water communication by the Maritza, which is navigable for flatboats all the year around and for barges from October to June.

The entrance to Lake Bori is shallow and shifts with a gale of wind.

Local sailing boats of about 30 tons can get over the river bar when unlading, the usual depth being 3½ feet; they leave Enos partly loaded and complete outside.

Coasting vessels of any size anchor with the town of Enos bearing about 41°, and have apparently a little shelter from southerly gales by the shoals of Cape Gremea. There is temporary anchorage off the town in 7 fathoms.

It is, however, recommended that when the summit of Samothraki is covered with clouds (an infallible warning) a vessel should gain an offing.

Telegraph.—Enos is connected by telegraph with Keshan and thence with Adrianople and Gallipoli.

Dedeagatch or Dedeagh.—This town is 9 miles northwestward of the mouth of Lake Bori or Maritza, and close eastward of some red cliffs; it stands on low ground covered with trees.

It is the principal port for the export of the products of the sandjak of Adrianople. The principal exports are cereals, hides, and tobacco.

The small harbor is very shallow, only affording shelter for lighters and small vessels; it has silted up considerably since it was opened in 1872, and has not been dredged, consequently it is very difficult for the lighters to load at the quay, especially during a northerly wind, when the water is always lower than at other times.

Eastward of the small harbor is a sloping sea wall, from which some iron framework piers extend; lighters drawing about 6 feet can load alongside them. Half a mile westward of the town is a good pier, 150 feet in length, with a railroad line connected with the Saloniki Railroad.

There is a depth of about 6 feet in the entrance to the harbor, and of 5 feet at the Custom house landing stage.

There are no facilities for repairing either hull or machinery.

Light.—To the westward of the town, and about 220 yards from the entrance to the small or caique harbor, a flashing light is shown from a white column. The light is elevated 115 feet above the sea and should be visible 16 miles. (See Light List.)

Anchorage.—The best anchorage off Dedeagatch is in 4½ fathoms mud, from ½-mile to 1 mile from the shore. The water shoals gradually from 10 fathoms at 3 miles distance to 3 fathoms at ¼ mile from the shore, excepting off the point immediately to the westward of the town, which has shoal water extending off it for ½ mile; otherwise a vessel may anchor anywhere. A vessel intending to anchor close inshore should not bring the small or caique harbor to the eastward of 7° when standing in.

Digitized by Google

There is no protection from southwest winds, which occasionally blow with great violence and cause a heavy sea. The fact of a current generally setting along the coast will cause a vessel to swing broadside to the sea and to roll heavily; vessels have usually to put to sea in consequence.

The anchorage off Dedeagatch is not safe in a gale from southeast around by south to west-southwest. Although the holding ground is not bad, an exceedingly disagreeable sea gets up with very little wind, and during a gale the whole place is one sheet of foam.

Directions.—Vessels bound for Dedeagatch and passing to the eastward of Imbros and Samothraki have two dangers to avoid—the Zurafa, an isolated rock 6¼ miles to the eastward of the latter island, and the shoal bordering the coast northwestward of Cape Gremea, the northern point of the entrance to the Gulf of Xeros. Several vessels have grounded on the latter danger by keeping so far over to clear Zurafa Rock as to pass too close along the shore southward of the town of Enos. Cape Gremea may be recognized by the hill near Enos, 620 feet high, and which makes as a double peak. From abreast the cape a conical hill in the range behind Dedeagatch should be steered for, which mark leads direct to the lighthouse. This hill can not be mistaken, as the hills eastward and westward of it are higher.

After passing the latitude of Zurafa Rock a berth of at least 2½ miles should be given to Cape Gremea (which makes as low yellowish cliffs) and also to all the coast beyond up to Dedeagatch. Enos will be seen on the side of a low hill, facing the sea (though it is within and on the southern side of the Bori Lake), and remarkable by its old citadel and walls. When abreast of Enos the red cliffs westward of Dedeagatch will be sighted, and make a good mark to steer for until the houses are seen.

The coast in the vicinity of Dedeagatch is low, with a sandy beach and a mountain ridge at a distance of about 2 miles. This ridge runs at an angle to the coast, joining it at Makri, 7¼ miles westward. At a little distance the ridge appears to slope to the sea at Dedeagatch, the flat land between not being visible.

Vessels passing westward of Samothraki should avoid its low northwestern point, as, although the island is nearly the highest in the archipelago, that end of it stretches out almost level with the sea for 1½ miles. At night too much caution can not be observed, as the proximity of the highland renders any judgment of distance doubtful.

Population—Climate.—The town has a population of about 5,000, and though clear of the low marshy ground surrounding the mouth of the Maritza, during the summer months fever is prevalent, which, however, is not considered dangerous and may in a great measure be avoided by taking precautions.

Digitized by Google

Communication.—Dedeagatch is connected by rail with Saloniki, Adrianople, and Constantinople, and, consequently, with the whole of the railroad system of Europe.

The Austrian Lloyds steamers call here fortnightly both ways from Trieste to Constantinople, connecting with the principal Greek, Turkish, and Black Sea ports.

The French Fraissinet steamship company runs steamers fortnightly to Dedeagatch from Marseille. These vessels call at Genoa, Piræus, Laurium, Saloniki, and Smyrna.

The Deutsche-Levante steamers call monthly on their passage from Hamburg and Malta to Taganrog.

Other steamers call at Dedeagatch several times a week, affording additional communication with Constantinople, Smyrna, and Saloniki. Vessels also run to Volo and other ports.

There is telegraph communication with the rest of the world.

Water is only procured from wells in summer, and is not good. In winter the Podomar, a small river that discharges at the eastern end of the town, affords an ample supply, but it is very muddy. No facilities for watering a vessel exist.

Supplies.—Meat, bread, and vegetables can be obtained by contract, but are scarce. No coal is obtainable.

Coast.—Cape Makri is a little salient, and about 1 mile eastward of it is a red cliff. The coast westward continues low, with beach and cliff to Fenar Point Lighthouse, a distance of about 29 miles. At about 10 miles westward of the cape Mount Marona near the sea is 2,174 feet high, and the coast at its base is skirted by rocks; farther westward red cliffs again appear, followed by an irregular, low, broken, sandy shore. At nearly midway between these latter cliffs and Fenar Point Lighthouse is a projecting rocky point, and about ½ mile southward of it are Apostoli Rocks, one of which is above water; these rocks are about 6½ miles from Fenar Point, and the shore between is bordered by shallow water, which extends a long way off and southward of Fenar Point for a distance of 1¾ miles.

The Mounts Marona, Zanthe (3,815 feet), and Pilaf Tepe (6,143 feet) are very conspicuous. The two latter are westward of Kara Agatch.

Kara Agatch Bay (Porto Lagos).—At 7 miles westward of Fenar Point is Cape Balustra, a low rocky projection; between these two points a low, broken, sandy shore, cut up with the outlets of lagoons, falls back about 4 miles and forms Kara Agatch Bay, known also as Porto Lagos, which is bordered all around by shallow water extending off in places more than 1 mile. Vessels, however, may anchor with offshore winds westward of the lighthouse, in about 7 fathoms water, and small vessels farther in at the head of the bay, as convenient.

Digitized by Google

The bay communicates with Lake Burughiul on the north by a narrow boat channel through the broken shore which separates them.

Lake Burughiul (ancient Bristonis), within the head of the bay, extends about 7½ miles north and south, is from 6 to 14 feet deep, and bounded on either side by extensive plains; two or three small streams run into it.

Light.—On Fenar Point, the eastern side of entrance to Kara Agatch Bay, is a lighthouse, from which is exhibited, at an elevation of 72 feet above the sea, a fixed white light, visible 10 miles. (See Light List.)

Shoals.—A shoal of 11 feet lies 1¾ miles 288°, and another, with 16 feet on its northeastern end, 2 miles 305° from Fenar Point Lighthouse. An isolated patch with 3¼ fathoms on it lies on the western side of the bay, bearing 78° 1.7 miles from the eastern part of Cape Balustra.

Obstruction.—A sunken obstruction, on which a vessel touched when drawing 15 feet of water, exists at a distance of 2.8 miles, 132° 30′, from Fenar Point Lighthouse.

Buoy.—For the use of the Australian Lloyds steamers calling here, a buoy is placed about 1 mile off the entrance to the lake, bearing 335° 30′, 2.2 miles from Fenar Point Lighthouse. This buoy is lighted when one of that company's steamers is expected at night.

Caution.—Vessels navigating in the vicinity of Kara Agatch bay should take every precaution, as the chart is compiled from a very old survey

The point 3 miles eastward of Fenar Point is reported to lie 1 mile farther southward than is now shown on the charts, and the 3-fathom bank northward of Cape Balustra is said to have extended farther to the eastward.

Communication.—The Austrian Lloyds steamers call fortnightly both ways between Trieste and Constantinople, connecting with the principal Greek, Turkish, and Black Sea ports. Kara Agatch is connected with the general system by telegraph with Zanthe (Skecher), a station on the railroad from Saloniki to Dede Agatch, which passes about ¾ mile from the head of Lake Burughiul.

Kara Su River.—This river (ancient Nestus) rises on the southern slope of the Balkans, and after a south-southeastward course for about 130 miles falls into the sea through the plain of the Nestus. It has two mouths, the western being the deeper, but both are completely barred by sand banks so that even boats of light draft can not gain an entrance to the river, and the land between the mouths is swampy.

(For coast westward of this, and Thaso Strait, see p. 194 et ante.)

Digitized by Google

CHAPTER IX.

ISLAND OF CRETE (CANDIA).

Crete (Candia) is from its position, fertility, and population the most important of all the islands of the Levant.

Crete is 140 miles in length, with a maximum breadth of 30 miles and a minimum of about 7 miles. An irregular but continuous mountain chain extends east and west, from one extremity of the island to the other. The western portion forms the lofty ridge named Madara Vuna, or the White Mountains, which attain an elevation of 8,100 feet. Mount Psiloriti, or Ida, situated near the center of the island, terminates in three lofty peaks, of which the highest is 8,060 feet above the sea.

The rivers are very numerous, but the majority are mere mountain torrents, dry in summer; even the largest become straggling streams and stagnant pools at that season, and should be carefully avoided, as they are centers of malaria.

The population, consisting of about 342,100, are for the most part employed in agricultural pursuits, in wine making, in the manufacture of olive oil, soap, dyeing operations, and, to a small extent, in carpet weaving.

The rural population is mainly Christian; but in some districts there is a large intermixture of Mohammedans, chiefly in the more fertile parts of the low districts and valleys near the principal towns. These Mohammedans are, for the most part, native Cretans, and their dress is so similar to that worn by the Christians as to render it difficult for a stranger, although he may be a Greek from the neighboring islands, to distinguish Mohammedan from Christian. The Cretans are very hospitable to strangers, and, as a rule, exceedingly bright witted, intelligent, and industrious, clever as artisans, brave, and honest. Greek is the common language of both Christians and Modammedans, the higher class of Mohammedans speaking Turkish also.

Government.—In 1908 after many years' agitation Crete declared its annexation to Greece. The agitation went on until October, 1912, when the Cretan deputies were admitted into the Greek Parliament at Athens, and after the declaration of war against Turkey the annexation to the kingdom became an accomplished fact. The treaty of peace between Greece and Turkey, November 1 (14), 1913,

Digitized by Google

formally handed over the island to Greece, and the Greek annexation was recognized by the Powers in December, 1913. (The Statesman's Year-book.)

Climate.—Crete from its position, being intermediate between the hot and arid air of Africa and the more humid atmosphere of southeastern Europe, is favored with a more genial climate than either. Its summer temperature averages about 80° F between the months of May and November in the low districts near the shore, and the winters are so tempered by the surrounding sea and its proximity to Africa that the thermometer seldom stands below 45° at the coast towns. Having several lofty mountains, with upland plains and secluded vales on their flanks, a milder temperature exists in them than in the open country and lowlands bordering the coast, depending in intensity upon their zone of elevation and aspect to which they are exposed.

Snow is present during winter at all summits above 6,500 feet, but it all disappears by the end of July. The climate is one of the most healthful in the Aegean Sea, and very similar to that of northern Sicily. Even the summer heat, though often great, is not unhealthful. This generally prevails from the middle of June to the middle of September. At other times extremes of heat and cold are rare and never of long duration. The average annual rainfall is 25 inches.

The best season for traveling in Crete is from the beginning of April to the middle of June. September and October are delightful months when fine but heavy rains are common at that season and often render the rivers impassable.

Products.—The fruits of middle and southern Europe may be grown in some of the upland regions, as may also some of the North African produce and fruits upon the lowlands, for the orange, grape, and olive flourish in the north and internal parts of the island better than in any other part of Greece or Asia Minor. Apples, pears, and potatoes are the produce of some of the upland districts and plains, while wheat of a remarkably white and good quality is grown in the low valleys on the south coast. The land is stocked with game, and the sea with fine fish; but the chief wealth of the country at present lies in its olive crops. Former revolutions and disturbances, arising from various causes in connection with political and religious animosities, tended to create a feeling of insecurity, so that, notwithstanding its genial clime and fruitful soil its prosperity and population have but slowly advanced.

Red-legged partridges, woodcock, and hares are found in all parts of Crete, and afford excellent sport to those who take the precaution to bring good dogs with them, for there are none in the island. There are also in some parts a few quail, mallard, teal, wood pigeon, and a

Digitized by Google

species of thrush, but no large game, except a small number of wild goats occasionally met with in the mountains. The Cretans say that their island is free from wolves, foxes, jackals, snakes, and all noxious and venomous animals.

Trade.—The principal exports are olives, olive oil, and other agricultural produce; soap, drugs, wine, and live stock. The imports are grain, cotton, and woolen goods, hides, etc.

Communication—Steamers.—The principal ports of the island are in weekly communication with Turkey, Egypt, Greece, and other parts of Europe, by the following steamship companies: The Austrain Lloyd's, Messageries Maritimes, Florio-Rubattino, Russian, Goudi, Compagnie de l'Orient, and Pantaleon. There are also fortnightly steamers belonging to the Mahsuse Co. of Constantinople, one running to and from Alexandria and another calling here from Constantinople to the coast of Barbary and back.

Telegraph.—The chief towns are connected with each other by telegraph lines and with the outer world by the Eastern Telegraph Co.'s cables.

Quarantine regulations.—The chief health office is fixed at Khania, and there are subordinate offices established at Suda, Rhithymno or Retimo, Megalo Kastron, Spinalonga, Port Nikolo, and Sitia; also subordinate offices, for local trade only, at Hierapetra and Sphakia.

Immediately on arrival at a port the captain of a vessel, whether naval or merchant vessel, must report himself at the health office, and no communication with the shore must take place until he has received pratique. Vessels are not allowed to perform quarantine in any port of the island, but must proceed to Vourlah Road, in the Gulf of Smyrna, or Beirut for that purpose.

Every vessel leaving the island and bound to a Turkish port must be provided with a bill of health procured from the health office, for which a fee, varying from 2 to 20 piastres, is charged. A foreigner, to obtain this document, must also bring with the passengers' passports a certificate from his consul, as well as one from the customhouse. When a vessel leaves the port without having unloaded her cargo it is not necessary to take a new bill of health, but to obtain a visé.

Pondiko Nisi.—The outlying islet of Pondiko Nisi or Rat Islet, and its little rock, close off its southwestern extremity, are about 6½ miles 245° from Cape Busa. The islet is ½ mile long, 730 feet above the level of the sea, steep-to, and has no anchorage; it is the ancient *Mylæ*.

Cape Busa, the northwest extremity of Crete, is a high and precipitous promontory stretching northward toward the island of Antikithera. It is 7 miles in length by about 1 mile in average

Digitized by Google

breadth, its highest part, the ancient Mount Korykos, reaching 2,560 feet above the level of the sea; two other summits attain, respectively, 2,430 feet and 807 feet.

Agria Grabusa is a bold and barren island lying northward of Cape Busa. The island is 1.2 miles long in a northwest and southeast direction by ¼ mile in average width. The passage between Agria Grabusa and Cape Busa is 800 yards wide, but the navigable channel is reduced to less than half this breadth by a reef extending 350 yards from the southeastern end of Agria Grabusa and a 3-fathom shoal from Cape Busa.

Grabusa Islet, about 1,400 yards in diameter and 450 feet high, is precipitous and surmounted by a fortress built by the Venetians to prevent its becoming the strongholds of pirates at the threshold of the Cretan Seas when Crete was in possession of Venice. The island is situated 1 mile southwestward of Cape Busa, with deep water between. The fortress renders the island very conspicuous from the westward.

Grabusa attained some celebrity in the war of Greek independence (1823), in which the Cretan Greeks took a long and energetic part against the Turks. The island was taken from the Turks by a surprise over its garrison of three, who then held charge of the stronghold. It was subsequently retained by Greek and Cretan pirates until 1828, when it was destroyed by a combined English and French squadron. It was during this last attack, on January 31, 1828, that the British naval vessel *Cambrian,* by an accident in missing stays, was wrecked upon the reef southward of the islet.

Grabusa Harbor is formed between a small peninsula, called Tigani (Frying Pan), lying southward of Grabusa and a long ledge of rocks, partly awash, extending southward from the southwestern end of Grabusa, like an artificial mole, but with a passage 800 yards wide and from 7 to 10 fathoms deep between its extremity and the rocks extending from Tigani peninsula. The bottom of the harbor is composed of a thin layer of sand over rock, and therefore affords no secure hold nor safe shelter during violent gales from the westward; it is therefore not recommended as an anchorage in southwesterly gales. The best shelter is with the eastern point of Grabusa Islet in range with the center of Agria Grabusa, and between the former and a black rock, lying 400 yards from the eastern side of the harbor.

Directions.—The safest channel into Grabusa Harbor is the northern, taking care, however, to give the eastern point of the islet a berth of 400 yards, to clear the shoal extending from it to the eastward and southward. In a northerly gale during winter it might be more convenient for a vessel caught near this entrance of the archipelago to run for this harbor, so as to be ready to take advantage of any change of wind or weather, in preference to lying-to and being drifted to leeward of Crete.

Digitized by Google

Kisamo Bay.—The entrance to Kisamo Bay is formed between Agria Grabusa and Cape Spada, which bears from the northwestern end of the former 71°, 8.3 miles. The bay from the line joining these two extremities runs in 10½ miles, and at its head is a narrow marshy plain with a sandy shore, behind which rise gentle ridges, well cultivated with corn, vines, and olives, and containing several villages.

A dilapidated Venetian fortress stands at the head of the bay, upon the site of the ancient town of Kisamo, and just over an old sea cliff; adjacent is a poor village and bazaar. The ancient mole which formed the old port of Kisamo is now visible to a height of nearly 20 feet above the sea, owing to a subsequent elevation of the coast; the harbor is consequently almost dry and choked with sand. A ledge of low sea-washed rocks, 1,400 yards northwestward of it, juts out to a point called Kavo Nisi and divides the head of the bay of Kisamo from the valley and bay of Masogia. The water shoals nearly ½ mile northward of Kavo Nisi.

Directions.—Being quite open to the northward, the bays of Kisamo and Masogia are not recommended as anchorages for sailing vessels, the bottom being generally sandy and the holding ground bad. Should a vessel, however, be unfortunately embayed and hampered between the promontories of Grabusa and Spada during a gale from the northward, she should run toward the southeastern angle of the bay and anchor in not less than 17 fathoms water off Tranisa Point, where the bottom is muddy and more tenacious than elsewhere. A well-found vessel, with the usual precautions of sufficient cable out, would here ride out an ordinary gale with safety.

Agios Sostis Bay.—Native coasting craft find shelter in a small indentation of the shore on the western side of Kisamo Bay, about 2½ miles southward of Cape Busa, called Agois Sostis, from a chapel existing there dedicated to this Greek saint. The water is, however, too deep for anchoring off it, and to obtain shelter it is necessary to have the stern secured to the northern shore.

Water may be obtained at the mouths of all the valleys, and a small supply of provisions from the adjacent villages.

Cape Spada (ancient *Psakum* promontory), the most northerly extremity of Crete, is easily recognized by a small conical hillock like a tumulus, which stands over its high and bluff extremity, the summit of which is 1,200 feet above the sea.

This remarkable promontory, projecting northward 11 miles beyond the usual line of the coast, has an average breadth of 3 miles. The land is generally about 1,800 feet high, but the ancient *Tityrus* Mountain rises near the center of the promontory to a height of 2,500 feet above the sea. The shape of this tongue of land is not unlike the blade of the sword; hence probably the name Cape Spada.

Digitized by Google

Cove.—On the eastern side of Cape Spada is a cove at the mouth of rocky glen, called Kantzilieres, where coasting craft sometimes get shelter by securing close under its northern cliff. The ruins of the ancient town of *Dictamnum* lie at the mouth of the gorge or glen, and it was celebrated for its temple to the heathen goddess Britomart, under the name of Dictynna.

Khania Bay is formed between the peninsula of Cape Spada and the bold and broad peninsula of Akrotiri, the northern termination of which is Cape Tripiti, bearing nearly 105°, distant 20 miles from Cape Spada. The bay recedes from this line 6½ miles on the eastern and 8½ miles on the western side, and the town of Khania, on the low shore near its southeast angle, may be distinguished at a distance of 9 or 10 miles.

To the southward of the town of Khania rise the lofty mountains of the Madara Vuna, the ancient *Leuce* or White Mountains, so called no doubt from their bare, bold, whitish summits, or from retaining snow on some of their peaks during a great part of the year. The Madara Vuna are a broad mass of naked crests showing a serrated outline, without any remarkable feature or peak as a defined summit.

The Malaxa and Therison Ridges are spurs extending from the Madara Vuna to the northward, and at the base of these spurs lies the bay of Suda, with the fertile plain of Khania extending westward from it, luxuriant with fine olive groves and studded with thriving villages. The Madara Mountains are visible from the south coast of Greece; Agio Pnevma, 7,650 feet high, although not the highest, is one of the most eastern and easily recognized peaks, from its somewhat conical form.

Theodoro Islet—Anchorage.—Theodoro is a barren islet, 540 feet high, lying 4 miles westward of Khania and ½ mile from the shore. The shelter it affords is very limited where the holding ground is good, but it only requires confidence in the management of the vessel to insure taking a berth close to the northeastern point of the islet, and thus to anchor where shelter will best be obtained. To do this the starboard anchor should be let go in 9 or 10 fathoms water at about 100 yards off the northeastern extremity of the islet, when bearing about 15°, and the other anchor about 242° of it, about the same or even a less distance from the shore, in 5 or 6 fathoms, when the point bears about 51°. A chain may also be taken to the rocks if practicable.

The bottom here is a stiff muddy sand and good holding ground, and the shore is so bold as to have 4 fathoms close alongside it. The ground off the southern portion of the islet is loose sand. The channel between the islet and Crete is shallow and obstructed by rocky patches. The only safe anchorage is consequently that close

Digitized by Google

under the northeastern extremity of the islet, both in respect to depth of water and nature of bottom.

The Venetians had a fortress on Theodoro to protect their larger trading vessels while waiting their cargoes from Khania and other ports. They used to anchor here in safety, with shore-fasts to the islet as recommended.

Khania (Canea), the ancient *Kydonia*, the capital of Crete, is regularly built, but with narrow streets; a rampart runs round the town, but is in rather a dilapidated condition. It is the residence of the high commissioner. The European consuls also reside here, in consequence of its proximity to the fine bay of Suda, and from its having a small port convenient for vessels of light draft. It is the principal trading place in the island, and its population is about 25,000.

The greatest tolerance exists in all religious matters. Besides 11 mosques, there are 2 Greek Churches, 2 Jewish Synagogues, and a Roman Catholic Church. Each faith is well provided with schools, to the maintenance of which the local government contributes liberally. Of the 3 Greek schools in Khania, one is a primary school, another a girls' school, and, finally, an upper school or lycée. The Mohammedans have a primary school and 3 lycées, also an excellent girls' school.

The water supply of Khania is obtained from a spring at Butzunaria, about 5 miles distant, from which is it brought by pipes.

The country around Khania is not only fertile but exceedingly well cultivated. The only product exported to Europe is oil, of two qualities, chiefly shipped to France and Austria. Part is used locally for making soap, of which there are many factories in Khania and Megalo Kastron, or Candia.

Communication.—Khania is in telegraphic communication with the principal towns of the island; also with Rhodes, Alexandria, and Syria. A cable is also laid to Zante, and thus messages may be sent to all parts of the world.

The Austrian Lloyds steamers call here weekly from Trieste, Piræus, Smyrna, Constantinople, etc.; the Messageries Maritimes steamers from Marseille monthly; the Russian Co.'s steamers run weekly to Piræus. The Florio-Rubattino Co.'s steamers call weekly on their passage from Genoa to Odessa and biweekly from Syracuse and Malta.

Trade.—Oil, soap, wine, and oranges are largely exported to all the Levantine ports, especially Egypt. Almonds, cheese, and caroobs or locust beans are also exported, though in smaller quantities. To these may be added in winter the export of Cretan snails. Silk gauze (similar to that of Brusa) lace and colored woolen and cotton goods are largely produced throughout the island, but not exported.

Digitized by Google

Many potteries exist, but the wares are for home use only. Among eatables, the delicious cream cheese ("Cheese of Flowers," as the Greeks call it) deserves notice, and among textile fabrics the pretty-patterned, many-colored cotton yorghans, a specialty of the Sphakia Mountains.

Telegraph cables.—Three cables are landed near the ruins of an old convent, close east of the fortifications. One cable is laid to Zante, a second to Rhithymno, and the other to Megalo Kastron. They leave the shore in a northeasterly direction.

Hospitals.—Khania has civil, military, and naval hospitals, as well as an asylum for the insane. The climate is so healthful that the demands on all four institutions are happily slight. There are also in Khania public baths and clubs. Water is abundant and good.

Khania Harbor is formed partly by a ledge of rocks, which lies parallel with the coast, and partly by an ancient mole, built upon and extending from them, and upon which is raised a high sea wall or parapet, with a fort in its center. This mole extends from the northeastern bastion of the town wall, thence toward the northwestern bastion, leaving a channel 100 yards wide and 30 feet deep between the latter and a lighthouse at the extremity of the mole, but inside the depths quickly shoal to the shore.

Within the harbor is in the form of a double bay; the southern one lies directly opposite the entrance, where the water is deepest, but much exposed with northerly gales to an inconvenient and dangerous swell. Only vessels under 10 feet draft can be sheltered behind the mole. Around the southern bay is the marina, on which the custom-house and principal merchants' storehouses are situated; vessels with cargo consequently anchor here for convenience of trade and the greater depth of water. The eastern bay is long and narrow, and contained the arsenal of the Venetians; 13 of the original galley arches still remain, but the water in this part of the port is now so shallow that only vessels in ballast or of light draft and coasting craft can use it.

Caution.—It is impracticable to enter this harbor with a strong northerly breeze, and it is never prudent for a stranger to do so unless piloted by the captain of the port, who attends outside to conduct vessels to their berth, when it is safe to do so.

Light.—On the mole head, on the eastern side of the entrance to the harbor, is a white lighthouse 75 feet high, from which a fixed white light is exhibited at an elevation of 82 feet above the sea, visible 12 miles. (See Light List.)

Anchorage.—Steamers and even sailing vessels may often find it more convenient to communicate with the officials at Khania from the roadstead than by proceeding to Suda, especially in the summer or with any southwesterly wind. The best holding ground is in depths over 20 fathoms; sailing vessels should therefore not anchor

Digitized by Google

in less than this depth. Steamers anchoring nearer the harbor should avoid a rocky patch of 17 to 18 fathoms, 300 yards in diameter, from the center of which the lighthouse bears 170°, 1,200 yards. It is not safe for a sailing vessel to remain with a rapidly rising barometer during or immediately after a southwest gale, or with a threatening gale from the northward; under these circumstances the shelter of Suda Bay should be obtained.

To avoid injuring the telegraph cables laid on the eastern side of Khania Bay, vessels should not anchor with the northeast angle of the bastions bearing westward of 185°.

In case a vessel should have remained too long or be caught after leaving the port and can not then reenter or beat out of the bay against the head swell she should then run for Theodoro Islet and endeavor to bring up close under its northeastern extremity.

Akrotiri, almost an island, about 6½ miles in diameter, separates Khania Bay from that of Suda. This peninsula, the ancient *Kyamon* Promontory, is joined to the main by an isthmus only 1.6 miles across. Cape Mavro Muri, its northwestern extremity, is low and from the shore 1 mile northeastward of it is a ledge of rocks and foul ground extends ½ mile northward, which must be avoided in rounding the promontory to or from Khania. In strong northerly winds a wide berth must be especially given to this part of the coast, in consequence of the uncertain set of the currents and heavy swell.

The land beyond Cape Mavro Muri is bold and high; Capes Tripiti and Maleka form bluff headlands, and 2½ miles south of the latter cape and 1 mile from the eastern coast is the highest peak, a conical summit named Mount Viglia, reaching an elevation of 1,745 feet above the sea. With the exception of the foul ground north of Cape Mavro Muri, the peninsula is steep-to on all sides and has an elevated plateau in its center, around which are several villages.

Manati Islet, or **Paleo Suda.**—From Cape Melaka the eastern bold coast of Akrotiri trends south-southeastward 3½ miles and then south-southwestward 2½ miles to Manati Islet, which is less than 400 yards from the coast, with a narrow 3-fathom channel between. There is anchorage southwestward of Manati Islet, in from 12 to 17 fathoms water, on a bottom of muddy sand, convenient for waiting until daylight or remaining even during a gale, if no supplies are required or communication desired with Khania. It is invariably found that the wind lessens in force as the entrance to Suda Bay is neared. The mass of mountains forming the Madera Vuna, or White Mountains, lying so immediately over the gulf, acts apparently as an obstruction to the wind and prevents its full force fetching home upon the coast beneath it.

Suda Bay, the entrance points to which may be said to be Manati Islet and Cape Drepano, is one of the safest and most capacious ports

Digitized by Google

in the Levant. It is most conveniently situated for vessels just entering the archipelago and seeking shelter from a rising northerly gale in the winter, at which time it is most frequented by wind-bound vessels of all nations.

Suda Islet.—The islet of Suda is 1¼ miles southwestward from Manati Islet and separated from the shore of the promontory by a channel 450 yards in width, but which is farther contracted by a shoal nearly 200 yards in diameter, with a rock on it, nearly in the middle of the fairway. The islet is surrounded by white cliffs, but they are not seen until a vessel is within a mile or two of the entrance. The fort on the islet is a complete ruin. To pass between Suda Islet and the shoal a small vessel should keep the ruined though conspicuous red tower at the head of the bay in line with a peaked hill at the back of it, bearing 272°.

Light.—On the south part of the fortress a fixed white light is shown from a height of 82 feet above the sea, and is visible 10 miles. (See Light List.)

Cape Drepano is a bold point of land, with a high and flat table summit and a rocky tongue like a reap hook forming its extremity, from whence its name is derived. The table hill, 1,830 feet high, over Cape Drepano, is a good landmark for distinguishing the entrance to Suda Bay, while the northern side is distinguished by the sharp conical peak of Mount Viglia.

Light.—At 328 yards within the extremity of Cape Drepano is a white tower, from which is exhibited, at 197 feet above the sea, a fixed white light varied by a flash visible 17 miles.

Kalivia Bay.—The south shore of Suda Bay trends in a southwesterly direction 2½ miles and then northwestward about the same distance to Suda Point. The western portion to this bight is called Kalivia Bay, from the shore of which a shallow bank extends from 400 to 600 yards.

Suda Point, surmounted by Paleo Kastron, the ancient *Aptera,* is situated 1,700 yards southward from Suda Islet. An ancient mole with 6 to 10 feet of water over it extends 250 yards northward from Suda Point. From Suda Point the south shore of the bay trends westward 1½ miles and then west-northwest nearly 2 miles to the dockyard. A depth of 10 fathoms will be found 200 yards from this shore.

Northwestward ½ mile from Suda Islet, on the Akrotiti coast, is a small natural port (the ancient *Minoa*), now only accessible to boats, as a ridge of shingle bars its entrance.

From Suda Islet the north shore of the bay extends west-northwestward 4½ miles to the head. The northern, like the southern, shore is fairly steep-to for 2.6 miles, or ½ mile westward of Spartea

Digitized by Google

Cove, whence a line to the western side of the dockyard marks approximately the 10-fathom curve. After passing westward of Suda Islet and Point the water deepens to 123 fathoms, and depths too great for anchorage continue until within 1½ miles of the head of the bay, where there is a depth of 20 fathoms.

Suda Bay is inclosed between steep sterile hills, the rich plain of Khania extending beyond it to the westward, with its luxuriant groves of olives. The road to Khania by the plain from Azizieh is about 2½ miles in length, upon a paved road, and a traction engine with an omnibus attached runs frequently.

Directions.—In making for Suda Bay from the northward the peninsula of Akrotiri is remarkable and the conelike shape of Mount Viglia can not be mistaken. Cape Drepano Lighthouse is not easily distinguished, but the high, flat land at its back shows out well. Manati Island is low, and will not be seen until well in; round it at any convenient distance, and then steer with the southern end of Suda Islet a little on the starboard bow.

Pass about 700 yards southward of Suda Islet, or midway between it and Suda Point, then steer about 285° for the anchorage abreast the dockyard. As the head of the bay is surrounded by shoal water and the bottom in places uneven, attention should be given to the lead, and a large vessel should not go into less than 8 fathoms water nor bring the minaret in the dockyard to bear southward of 183°.

Anchorage.—The best anchorage in Suda Bay is off the dockyard, in from 13 to 16 fathoms, and nearer the southern shore than the northern. On the northern side the bottom is very soft mud, which affords but little hold for the anchors. Northerly winds are not dangerous in this bay, but southerly winds blow in gusts and sometimes intercept communication with the shore, more especially from January to March, when southerly gales are frequent.

The dockyard is easily recognized by the high wall surrounding it, and by the sheds, factory, building slip, and minaret. The red mound at the head of the bay, although in ruins, still remains a good distinctive mark, and the village of Azizieh by its buildings. The minaret of the mosque at Azizieh village, at the head of the bay, has fallen down, and can not now be seen. The white mosque at the village of Chakalaria, 1 mile southward of the head of the bay, is also conspicuous.

Winds and weather.—January, February, and March are the bad weather months; during this season there are frequent gales and much rain. During the summer months an occasional gale, generally from the westward, may occur, but as a rule the winds in Suda Bay are local; light airs from the westward are experienced in the mornings and forenoons, and winds from seaward in the afternoon,

Digitized by Google

falling to a calm a little after sunset. During northwest or northerly winds outside, it will generally be from west or west-northwest in the bay, caused by the valley at its head and the hills on either side. The southeast and southerly winds, as at Malta, are hot and oppressive, and the bay being inclosed with high land, except at the entrance, the hot winds from off it are felt from every quarter. The weather in summer is generally fine and clear, but the heat is oppressive; and owing to the close proximity of a few marshes, fever and ague, generally in a mild form, prevail at this season.

Bills of health.—These can be obtained from the customhouse at Suda village, and time will be saved by a medical officer attending there early with the necessary papers, as the authorities do not visit vessels on their arrival, though the health regulations are rigidly exacted.

The dockyard, on the southern side and about ¾ mile from the head of Suda Bay, is a small Government establishment containing 1 building slip for a vessel of about 2,000 tons, several workshops, sawmill, factory for repairing engines, a crane to lift 8 tons and large steam hammer; adjoining the yard are coal depots for the navy. The whole yard was reported to be deserted in 1905, the crane only being in use.

Azizieh.—At nearly ¾ mile westward of the dockyard is the new village of Azizieh, called after a late Sultan. It stands on the site formerly called Tuzla, from its salt pand. The land in its vicinity has been drained and the place converted from a plague spot into a neat, well-to-do village with stone houses.

The number of persons in Azizieh does not exceed 1,000.

Telegraphic communications.—A land line belonging to the Eastern Telegraph Co. connects Suda with Khania, and thus with all parts of Crete and the rest of the civilized world; the telegraph office is inside the dockyard.

Supplies.—Fresh meat and vegetables may be obtained, and other provisions are plentiful and cheap. The water is too deep and the small bays not sandy enough for the seine, but a few salmon bass of a large size may occasionally be caught.

Coal.—About 2,500 tons of coal are usually in stock. It is brought off in lighters of from 10 to 20 tons and one 50-ton lighter.

Water.—At the village of Kalivia, in the bay of that name already alluded to, there are fertile hills and valleys, with copious rivulets of limpid water falling through them from the Apokorona district. One of these streams is deep and navigable for a short distance, and the water is excellent; but the others are brackish near the sea. The best summer watering place for a fleet, or for a vessel when not required to go to the head of Suda Bay, is from the fountain at the foot of the hill of Paleokastron, about ½ mile westward of Suda

Digitized by Google

Point. The water is of excellent quality, and the boat being able to get close in to the beach can be filled at the rate of about 4 tons an hour. There is a stone pier or jetty about 200 feet in length, a little eastward of the fountain, constructed for landing troops. The ruins of the ancient city of *Aptera* lie over the spring. There is summer anchorage for large vessels in 16 fathoms of water on the bank southeastward of Suda Islet and convenient to this watering place, but occasionally there is a heavy swell from the northeastward.

A tank vessel of about 10 or 12 tons is attached to the dockyard, and the water supplied is very good. Steam cutters can water alongside the dockyard jetty on getting permission from the authorities, but must take care not to get aground. At the head of the small river northward of Azizieh is an excellent spring of water, but during the summer months the bed of the river is dry a little within its mouth.

The coast from Cape Drepano, forming the west side of Armyro Bay, trends nearly southward for a distance of 7 miles to the mouth of the Armyro River, at the southwestern corner of the bay of the same name. This coast is nearly straight, cliffy, and steep-to.

Armyro is a ruined fort about 1 mile within the southwest angle of the bay, where numerous sources of clear but brackish water issue and unite with a fresh-water rivulet flowing out of the gorge or pass in the western mountains that separate the Apokorona Valley from the Armyro Plains. Thus united, these waters form a small stream debouching on the shore. On the south side of the mouth of this stream stands a well-built though small village of white houses, which can be seen from a distance of 10 or 12 miles. Close to its mouth is Nikola Islet, 8 feet high, on which stands a very conspicuous white stone house.

The river has at present a bar of rock and sand across its mouth, over which there is not more than 3 feet, but in ancient times it formed a winter harbor for vessels, when, probably, its entrance was deeper, as the adjacent cliffs show a rise of the coast of about 6 feet in historic times; and the same evidence exists in the bays of Suda and Khania, but to a greater extent.

Rhithymno or Retimo, the third town in size in Crete and the capital of the central district of the island, lies 13 miles, about 119° from Cape Drepano, and extends over a rocky projection of the shore. It is surrounded by fortifications, with a citadel at its northern end, both being the work of Venetians.

A small harbor opens to the southeastward between two short moles, but at its best it only admits vessels of a less draft than 4 feet, and was reported in 1908 to be almost impassible even for lighters. The entrance of the harbor is badly situated, being in a direction to receive the littoral drift from the sandy shore eastward

Digitized by Google

of it; and thus dredging, which periodically takes place, has no permanent effect in maintaining the depth at the entrance.

Trade.—The chief exports are oil, soap, wine, silk, locust beans, and valonia. The imports are potash, cereals, manufactured goods, hardware, timber, and salt fish.

Population.—The population amounts to about 9,400.

Communication.—Austrian Lloyd's steamers call here fortnightly, connecting with Trieste, Piræus, and Constantinople; other steamers run to the other towns in the island, and also to Greece, Alexandria, and Turkey. A land telegraph line connects Rhithymno with the principal towns of the island, and a submarine cable is laid to Megalo Kastron, whence communication may be had with all parts of the world. A cable is also laid to Khania.

Telegraph cables.—The above-mentioned cables are landed at a cable house situated near Gube Spring, about 1,400 yards westward of the town. The cable to Khania leaves the shore in a northwesterly and the other in a northerly direction; vessel must avoid anchoring over them.

Supplies.—Fresh meat, bread, vegetables and fruit can be obtained in small quantities.

Light.—From a white tower 27 yards from the southern extremity of the mole on the northeastern side of the entrance to the harbor of Rhithymno a fixed white light is exhibited at an elevation of 49 feet above the level of the sea, visible 12 miles. (See Light List.)

The anchorage is northeastward of the town, on a bottom of muddy sand, in about 8 fathoms water, with the northern end of the town bearing about 262°, distant ½ mile; being entirely open to the northward, it is only available for sailing vessels during fine weather in the summer season or with settled southerly winds. A vessel, however, well found in anchors and cables and with sufficient cable out would ride in safety most of the summer gales, although experiencing a considerable swell during its continuance. A berth for a large vessel is in 12 fathoms, sand, with the eastern extremity of the fortifications bearing about 183° and the northern extremity of the fort 237°. The bottom can be seen in 6 or 7 fathoms water.

Armyro and Rhithymno Bays are separated by a long strip of rocky coast, 6 miles in extent. The bottom in them is clean sand, and the depth of water diminishes gradually toward the shore, affording good temporary anchorage. The sandy shore of Rhithymno Bay terminates at Cape Maletzi, about 7¼ miles eastward of the town.

Mount Psiloriti or Ida.—At Cape Maletzi the spurs of Mount Ida, or Psiloriti of the moderns, extend to the sea and advance to the northward 3 or 4 miles beyond the general direction of the coast for a distance of more than 20 miles, forming the rocky Capes Liano Kavo, Khondro, Kavo, Stavros, and Dhia. Mount Psiloriti or Ida,

Digitized by Google

about 8,060 feet above the sea, when seen from the northwestward has a lofty conical form, but with a broad undulating summit from the northward and northeastward and opposite directions.

In the bight immediately westward of Khondro Kavo is a recently constructed village, affording a good landmark, called Kastelli Melapotamo.

It is very exposed to the northward, but is a fairly important place. Landing is reported to be possible at all times on a small sandy beach about 500 yards to the westward of the usual landing place, under the lee of rocks which are nearly awash.

Bali Bay, 7 miles eastward of Liano Kavo, has a cove on its western side where coasting craft anchor and secure to the shore, finding shelter from the northerly gales of summer, which in general blow from north-northwest and north. It is only available for coasters, but is mentioned here as being a place of refuge for vessels of light draft in case of need, where, by dropping an anchor off the mouth of the cove in about 6 or 7 fathoms and hauling it under its northern point, good shelter may be obtained during the usual summer gales. Its position may be known by two sharp peaks rising just over it, to the westward of which are two or three old towers on a lower ridge rising gradually from the coast at the end of Rhithymno Beach.

This cove seems to have been a recognized port of Crete in ancient days as the Panormus Portus, or Astale of the Stadiasmus, there being no other harbor on this part of the coast with which to identify it. The ruins of a small coast town and fortress exist about 5 miles to the westward, but there is no port there.

Current.—The navigating officer of the British naval vessel *Scout* reported that during the month of April, 1897, the currents appeared to be very variable between Akrotiri and Candia Bay, but that an easterly current was generally experienced, the wind being usually from a direction westward of north and south.

The navigating officer of the British naval vessel *Minerva* reported that during the month of June 1905, very little current was experience on the north coast of Crete, but what there was was always to the eastward. A curious phenomenon appears off this coast after a northwest gale. The water becomes a pale green for a distance of from 1 to 2 miles, according to the length of time the wind has been blowing, having the appearance of shoal water, the line of demarcation between it and the outer blue water being very distinct.

Cape Stavros, about 9 miles eastward of Bali Bay, is a very conspicuous low-lying point having a long tongue, and is a very good mark when approaching from eastward or westward. Phodele Bay, on the western side of Cape Stavros, is of no importance.

Cape Dhia, about 2½ miles east-southeastward of Cape Stavros, terminates the high and rugged coast which separates the bay of

Digitized by Google

Rhithymo from the bay of Candia, and is clear of danger. Cape Dhia has a small rock off it, which looks like a sail when approaching from the westward.

Panagia Point.—This headland, 1½ miles southeastward of Cape Dhia, has two projecting points. The northern one may be known by its very rugged, barren appearance, having on its summit, which is 270 feet high, no vegetation whatever. The southeastern projection is called Panagia Point, posesses some vegetation, is lower, and has a more even top than the 270-foot summit.

Rodia.—From Panagia Point the coast trends westward of south for 2¾ miles; here its character changes to that of a low shore which continues eastward 3.6 miles to Megalo Kastron. Two miles southward from Panagia Point is the little valley of Rodia, which descends from a village of the same name, situated high on the sides of the mountains over that shore; off this valley there is anchorage.

Here the Venetian merchant vessels of large burden used to anchor in the summer season, in order to embark their cargoes direct from Crete, and here they would be quite safe between April and November. A fort called Palaio Kastro commanded the roadstead in the time of the Venetians, and its remains exist on a rock just over the mouth of the Rodia Valley.

The anchorage is in from 15 to 25 fathoms water at 400 and 600 yards from the base of the ruined fort, where there is good shelter in all ordinary gales from the northward, as they seldom veer to the eastward of north-northeast, except in the winter months.

Water.—A supply of good water can be easily obtained from the mouth of the large rivulet which flows into the western part of Candia Bay near Armyro, but not at the Armyro Rivulet, as that is brackish.

Megalo Kastron or Candia Town (ancient *Heraklea*) is situated on the low shore of Candia Bay, 7 miles southeastward of Cape Dhia, with a small artificial harbor. The fortifications surrounding the town have a circumference of about 2½ miles, and, although much injured by the memorable siege it endured before the Turks took it from the Venetians in the year 1669 and from recent earthquakes and neglect, monuments of the skill and wealth of this once powerful republic still exist.

This town was perhaps unequaled by any coast town in the Levant for strength and beauty, and bears evidence of having been a fine as well as a large city. Several churches, fountains, and public buildings of that time still remain, although they are now mostly in partial ruin, caused either by the earthquake of 1856 or from previous neglect.

The Greek Church, with a dome and two square towers on its eastern side, is the most conspicuous object in the town.

A short distance from Megalo Kastron are the remains of the Minoan city of Knossos discovered in 1901.

Digitized by Google

The population of the town of Megalo Kastron or Candia is about 22,774.

The harbor, at the northeast angle of the town, is formed by two moles, the western one running out 320 yards 54°, the eastern extending 130 yards 15°, leaving a breadth in the entrance of about 50 yards. In summer and in fine weather a vessel drawing 12 feet water may enter, but in winter or with any swell on a vessel should not draw more than 10 feet. Strong northeast winds are said to reduce the water in the harbor. In 1905 it was reported that sand had so filled the harbor that only small sailing vessels could enter.

There are no jetties in the harbor, nor cranes to facilitate the landing of heavy articles; 10 or 12 vessels from 100 to 150 tons can find accommodation within it.

Lieut. G. B. Hutton, of the British naval vessel *Starling,* in September, 1889, remarks: "The northerly wind here causes a very nasty sea at the entrance of the harbor, and a vessel secured alongside the west mole, under the lighthouse fort, must look well to her moorings." The *Starling* carried away her bower cable, a 2½-inch steel wire, and a 4-inch hemp hawser during one night. The safest plan is to lie with bow toward the west mole, secured by the two bower cables to bollards, and the stream anchor out astern.

Light.—A fixed white light is exhibited, at an elevation of 70 feet above the sea, from a tower on the extremity of the mole on the northern side of entrance to Megalo Kastron, visible 12 miles.

Anchorage.—There is good anchorage in the road off the town during summer for a well-found vessel at about ¾ mile northward of the lighthouse, in 18 fathoms water, muddy sand. A steamer may anchor in 9 fathoms 600 yards from the lighthouse, but a vessel which can not enter the harbor and is waiting for a cargo in winter will find either East Bay, or Panagia Creek at the head of Middle Bay, in the island of Standia, a safe anchorage to remain in. Panagia is the more sheltered, and here the merchant vessels of large burden in the time of the Venetians used to lie to discharge or receive their cargoes from sailing lighters sent out from the town.

In order to avoid fouling the telegraph cables, vessels are recommended not to anchor to the eastward of a line drawn 36° from the east (inner) corner of the breakwater.

The navigating officer of the British naval vessel *Diana* states that in July and August a continuous northwest wind is experienced at the anchorage, which moderates at night, freshens at sunrise, and attains its full strength about noon, attaining considerable strength and raising a heavy sea at the anchorage.

The navigating officer of the British naval vessel *Anson,* which was anchored off the town in the winter of 1898, considers that signs of a coming northerly gale are a swell and drop in temperature.

Digitized by Google

He also noticed that the belt of light-colored water which usually fringes the shore to beyond the large vessels' anchorage was much narrower a few hours before a northerly gale.

The British naval vessel *Hebe* was anchored during July and August, 1899, 400 yards 40° from the lighthouse, which position generally gave her boats a leading wind to and from the harbor.

Supplies.—Fresh meat, vegetables, and fruit are obtainable, but no coal for steaming purposes.

Communication.—There is weekly communication by the Austrian Lloyd's steamers with Trieste, Piræus, Constantinople, etc., and weekly communication with the ports of Turkey, Egypt, and Greece, by the following companies: Courtzi Co. of Constantinople, Panhellenic, and Greek Co. of Syra. Fortnightly by the Mahsuse Co. of Constantinople, whose steamers run two direct lines, viz, one to Alexandria and back and the other from Constantinople, touching here, and thence to Benghazi, Tripoli, and Malta, returning over the same route.

Trade, shipping.—The exports consist principally of oilve oil, wine, soap, locust beans, fruit, and silk. The imports consist principally of flour, salt fish, tobacco, petroleum, timber, iron, and cotton and woolen goods.

Telegraph cables are laid from Megalo Kastron to Khania, Sitia Bay, and Rhithymno, in Crete. Communication with the outer world is had by means of cable direct to Syra, and via Sitia Bay to Rhodes and Alexandria.

Standia Island (ancient *Dia*), lying nearly 6½ miles northeastward of the town of Megalo Kastron, is an elevated mass of limestone, bare and sterile throughout, its highest part, near the center, rising 870 feet above the sea. The island is 3 miles long and 2 miles wide. Its northern coast is precipitous, and its southern is steep also, but indented with 4 bays, 3 of which afford anchorage and shelter from northerly gales. These bays are useful for coaling and similar operations in northerly winds.

There are rabbits and goats on the island, quite wild, but difficult to reach in consequence of the heavy nature of the ground.

East Bay would hold 15 or 20 small vessels when moored with their sterns to the shore, and an anchor in the center, in not less than 14 or 15 fathoms water, from whence they would not drag with southerly winds, as the bank is steep and the holding ground good.

A conspicuous stone block lies close to the shore at the head of East Bay, which, bearing 359°, makes a good mark for the center of the bay.

A wreck lies about 15 yards off the point on the eastern side of the bay, 467 yards 53° from the stone block above mentioned.

Digitized by Google

In August, 1897, the British naval vessel *Scylla* anchored in the mouth of this bay in 43 fathoms, with the east side of the stone block bearing 348° 30′ and Middle Bluff (the point dividing East and Middle Bays) bearing 264° 30′.

In February of the same year the British naval vessel *Nymphe* found good anchorage in 17 fathoms in the center of the bay, with the stone block bearing 0°, 250 yards; but as the distance between the 5-fathom curve on each side is less than 300 yards, the head of the bay is not suitable for long vessels.

Middle Bay, the next westward, has a well-sheltered creek at its head, named Panagia, running northeasterly to the mouth of a rocky ravine. Here a few vessels can secure to both shores, and the tranquility of the creek, with the depth of water alongside the shore, renders it a most convenient place to effect repairs.

Middle Bay should be used by large vessels, anchoring in 38 fathoms in the center of the bay.

Directions.—As anchoring marks a pair of temporary beacons, whitewashed, were put up in 1897 on the point at the head of the bay dividing Panagia Creek from the cove westward of it. Another pair were erected near the west shore, 334 yards northward of Cliff Point, the western entrance point to Middle Bay. The point of intersection of these lines bears about 55°, 500 yards from Cliff Point.

As it is necessary for a large vessel to anchor exactly in the middle of the bay, it is best before arriving in position to ease down 2½ shackles of chain and the remainder on the spot, to avoid being drifted away by the strong, eddy winds while the whole 3 shackles were being eased down. The northern beacons in range, bear 13° 30′, and the western pair, 277° 30′ when in range.

Royal Oak Bay, the next west of Middle Bay, affords for vessels less than 350 feet in length more shelter than Middle Bay. The depth of water is about the same; bottom, sand and shells.

West Bay is of little service.

Islets.—Two islets lie close to Standia, one named Glaro Nisi or Gull Islet, to the northwestward, and Paximadi, 355 feet high (reported in 1905 to be only 145 feet high), to the eastward, off which the water is very deep. Between Glaro Nisi and Standia a rocky reef, partly above water, almost closes the passage between them.

Water.—There is no good water on Standia Island, but it may be procured at the Kartaro River, 2.6 miles eastward of Megalo Kastron.

Ovo, a precipitous rock or islet 170 feet high, lies 18 miles 60° from the northeast point of Standia, and has deep water all around it.

Cape Khersonisos lies 12 miles eastward of Megalo Kastron, and the coast is nearly straight between them. The cape may be known by three windmills and a church upon it.

Digitized by Google

The interior of Crete between Megalo Kastron and this cape is comparatively low, being a depression lying between the eastern base of Psiloriti or Mount Ida and the third highest range of mountains, called Lasethe, which rises to a height of 7,100 feet, southward of the bay of Malea.

Rocks.—A rock lies at the foot of the cape and shallow water extends nearly 400 yards outside it. At a little more than ½ mile southward of the cape is another rock, square, and 7 feet high, called Square Rock, with sunken rocks around it; between the cape and Square Rock is Khersonisos Bay.

Khersonisos Bay.—During the summer gales, which prevail from the north-northwestward, coasting craft and local traders take shelter in Khersonisos Bay, close under the cape, in 5 or 6 fathoms water, sand and weed, or anchor there to load with carobs or grain, the main produce of this district. The British naval vessel *Spitfire* found good shelter under Cape Khersonisos during a strong northerly summer gale, although the swell was a little inconvenient. A good anchorage for a large vessel is in 9 to 10 fathoms, 1,100 yards 60° from the ancient fortress of Khersonisos.

Southward of the bay is the small peninsula and ancient port of Khersonisos, the harbor of Lyttus, a city of some celebrity in the early history of Crete, and situated on the flanks of the Lasethe Mountains. The port is now too shallow to be available, although the moles exist, besides a theater and other remains of this once flourishing seaport town.

Malea Bay affords poor anchorage ground, the bottom to the eastward of Khersonisos being shallow and rocky for ½ mile. The British naval vessel *Diana*, in 1905, anchored in 16 fathoms, with a white hut on the islet off Malea village in range 176° with some red-roofed sheds on the foreshore, which indicate the position of the village. From the head of the bay the bold coast trends in a general easterly direction for nearly 17 miles to Cape St. John or Spinalonga.

Cape St. John or Spinalonga, 300 feet high, is well known to the local mariners for the force and constancy with which the northerly breezes blow from within a few miles of it toward the deep Gulf of Mirabella and over the Isthmus of Hierapetra at the head of this gulf, which is the narrowest and lowest part of the island of Crete, being only 6 miles across to the southern shore.

Lights.—On the extremity of Cape St. John or Spinalonga, two fixed white lights placed vertically are exhibited, the upper being 154 feet above the sea; visible 12 miles. (See Light List.)

Spinalonga Harbor is a spacious sheet of water inclosed by a long peninsula, also called Spinalonga, immediately southwestward of Cape St. John. Although the southern part of the harbor has from 4 to 4½ fathoms water over a great portion of it, a bank with only

Digitized by Google

12 feet on it stretches across from the north end of the peninsula to the mainland of Crete, and thus renders this fine inlet available for coasters of light draft only. The anchorage for larger vessels is thus limited to a small space just north of the fortified islet, lying close off the northern end of the peninsula, but being so immediately under the high precipices of Cape St. John it is difficult and dangerous for sailing vessels to enter, in consequence of the frequent and violent squalls which descend from this stormy point.

Vessels not exceeding 18 feet draft of water will find safe anchorage westward of Spinalonga Island, with the north end of it bearing 74° 400 yards and the mouth of a gully on the north shore bearing 347°. South-southwest winds are squally, but south winds blow steadily and right down the harbor.

Spinalonga has a health office within the dilapidated fortress built by the Venetians on the islet. The island is inhabited by about 80 Mohammedan families, who maintain themselves by fishing and coast trade and have the reputation of being skillful and excellent seamen. They have a few schooners and caiques, and carry on a trade with Asia Minor for grain and wood required to supply the larger towns of Crete. Spinalonga produces grain and whetstones, for the latter of which it has always been noted, the best Turkey stone coming from here.

Supplies.—Provisions of all kinds may be obtained here at moderate prices.

Port Kolokithia, on the eastern side of Spinalonga Peninsula, is formed by the islet of Kolokithia, which is narrow and ½ mile in length north and south, with a passage at either end. The port is open to the northeastward, and therefore never frequented as a winter anchorage. There are rocks extending a little off from both points of the northern entrance, in which there is 10 to 17 fathoms water in mid-channel. The southern entrance is contracted by shoals from either side, leaving a narrow tortuous passage into the port, carrying only 15 feet water. It was probably the port of *Olontia* in ancient times, the ruins of which city are seen upon the Poro Isthmus. A great part of the city has been submerged by a recent subsidence of the eastern part of Crete, which nearly made Spinalonga an island also, for the isthmus is only now just above the sea level, and with strong north winds the sea beats over it.

Poro Bay Anchorage.—On the southern side of the peninsula of Spinalonga, is a fine bay more than 1 mile wide, called Poro, where there is excellent shelter in a northerly or northeasterly gale for a squadron, and good holding ground of muddy sand and weed, in from 15 to 20 fathoms. This is the only bay eastward of Suda for which a large vessel could run for shelter in the winter season when caught in a northeasterly gale. It is open to the southeastward, but as the

Digitized by Google

fetch is only 7 or 8 miles across the Mirabella Gulf, a well-found vessel would ride any gale out from that quarter, or, by watching the ample warning then always given by the barometer when changing from north to south, could put out to sea.

Coral Bank.—Vessels anchoring should avoid this bank with coral bottom. The center, with 17 fathoms, bears 254°, 1,350 yards from Cape Vagi, the northeastern entrance point of Poro Bay.

Port Nikolo, or Mirabella, is formed between the coast and the two islets of Agios Antonio, or Nikolo Nisi, and Mikro Nisi, the former much the larger, being 867 yards in length north and south, and 140 feet high. Mikro is 300 yards in length, 75 feet high, and separated from Nikolo on the south by a passage 50 yards wide and 1 fathom deep. These islets lie about 3 miles south-southwestward of the peninsula of Spinalonga, and are 700 yards from the nearest part of the mainland of Crete.

Light.—A fixed white light with red sector is exhibited, at an elevation of 94 feet, from a white iron mast over a white house, 27 feet high, near the northern point of Mikro Nisi. It should be visible 13 miles in the white and 6 miles in the red sector. (For sectors see Light List and Chart.)

Mikro Nisi Rock, with 3 fathoms water on it, is on the outer end of a bank extending 267 yards, 74°, from the north point of Mikro Nisi.

Nikolo Islet, 2 feet high and surrounded by shoal water, is situated 900 yards, 271° from the same extremity of Mikro Nisi. In the narrow passage between Nikolo Islet and the main, distant 267 yards, there is a depth of 5 fathoms.

The southern extremity of the small promontory westward of this islet is named Nikolo Point, and westward of this promontory a shallow narrow creek runs in 600 yards, 344°.

Nikolo Rock, with 2½ fathoms on it, lies 334 yards 158° 30′ from Nikolo Point. Westward and northward of this rock there are depths of 5¾ to 7 fathoms, while in the main channel between the rock and Agios Antonio, distant 550 yards, there is a depth of 9 fathoms.

Six-fathom Patch is a rocky bank with that depth on it, lying nearly 400 yards westward of the north point of Agios Antonio.

Anchorage for coasting vessels.—This anchorage, in 8 to 9 fathoms, is on the northwest side of Agios Antonio and eastward of Six-fathom Patch, and this part of the port is always preferred by the local traders and Levant sailors, who are acquainted with it, to Spinalonga, for with one anchor to the westward and a stern-fast to Agios Antonio a vessel will lie landlocked.

Principal anchorage.—This anchorage, in 7 to 8 fathoms over sand, weed, and shells, is in the southern part of Port Nikolo and

Digitized by Google

westward of the south end of Agios Antonio. It is partly sheltered from the southward by Mavro Kavo, a rocky point upon which are some ruined habitations and churches of what was in the time of the Venetians a small fishing and trading town, called the Borgo di Mirabella, and was then the chief place of trade in this neighborhood, its port being then also preferred to Spinalonga, that being a coast garrison only. This seems to have been the ancient *Kamira*.

Here, southward of Nikolo Rock, there is anchorage space about 600 yards in diameter, with a passage in from the southeastward 400 yards broad, between the 5-fathom curve on each side, and a depth of 7 fathoms.

Pratique.—Vessels can obtain pratique here, a health office and a customhouse having been established.

Exports.—Carobs and oil are the chief exports of the Mirabella district, of which a few cargoes are annually exported to Europe and to Constantinople, and the produce is increasing.

Telegraph.—Mirabella is a telegraph station.

Water.—The only place in the Gulf of Mirabella where a vessel can procure water is at the valley southward of Port Nikolo, where by sinking a well 3 or 4 feet deep in the bed of the dry watercourse, and at a few yards from the sea, an abundant supply of excellent water may be procured at all seasons.

Paschiamo.—At the head of the Gulf of Mirabella anchorage may be obtained at 400 yards from a landing place called Paschiamo, and to the southward of Kunithia Island. From here a good carriage road leads to Hierapetra, on the south coast of Crete.

At Gurnia, near here, the remains of an extensive city of the Minoan period have recently been discovered.

Psyra Islet, on the southeast side of Mirabella Gulf, is about 1 mile in length northeast and southwest and its summit 693 feet high. Halfway across the Gulf of Mirabella, in a straight line from Psyra to the islet of Agios Antonio or Nikolo Nisi, lies Mirabella Bank, having only 24 fathoms water on it, close to a depth of 124 fathoms.

Soundings.—Generally speaking, along the northern coast of Crete, the 100-fathom curve of soundings is at about 4 miles from the coast, except near the projecting capes, where it seldom exceeds 1½ miles from the shore.

Sitia Peninsula.—On the eastern side of the Gulf of Mirabella is the beginning of the large peninsula and Eparchia of Sitia, from which rises the fourth group of mountains of Crete. Aphendi Vuno, the highest point, immediately over the Isthmus of Hierapetra at the commencement of the promontory, is 4,850 feet above the sea. The whole peninsula is very mountainous, and has several upland plains and fertile valleys, the largest being that of Sitia.

Digitized by Google

Cape Sitia, the western entrance point of Sitia Bay, has shoal extending from it 135 yards in a northeasterly direction.

Light.—On Cape Sitia is a lighthouse, from which a fixed red light is exhibited, visible 6 miles. (See Light List.)

Sitia Bay.—At the mouth of the valley of Sitia is a wide bay open to the north and bounded on the east by the long and indented promontory of Sidero. At the western angle of the bay, 1 mile from Cape Sitia, and standing upon a gently sloping but rocky shore, are the ruined fortress and town of Sitia, built by the Venetians, close under which there is good anchorage with shelter from the prevailing northerly winds. A chain should be carried to the shore under the fort as a bowfast for all vessels of light draft, or at about 400 yards northward of it, by all large class trading vessels desiring to anchor here, where, with the outer anchor in 7 or 8 fathoms water, mud bottom, 300 yards from the shore, Cape Sitia affords shelter from northwesterly winds as far round as north-northeast, to the eastward of which point it rarely blows until after Christmas.

Light.—An unwatched fixed green light, visible 4½ miles, is established on the point on the northern side of the anchorage in Sitia Bay.

The light is exhibited 36 feet above the sea and 23 feet above the ground from an iron hut on a masonry base located about 25 yards back from the water's edge.

Anchorage for large vessels will be found in 15 fathoms over mud, ½ mile 91° from the pier.

A fort stands on the northern side of the town, near the ruins of the Venetian fortress. The Venetians had bollards or mooring posts cut in the rocky shore for the convenience of their vessels trading or stationed here, which is a further indication of its security.

Water.—There is a well of excellent water close to the angle of the bay, which is supplied by a copious spring that never fails or diminishes.

Pratique—Supplies.—A health office and a customhouse have been established here. Vessels can now obtain pratique and some supplies.

Telegraph.—Submarine cables from Alexandria, Megalo Kastron, and Rhodes are landed at Sitia. The town is also a telegraph station.

Yanisades Islets, four in number, lie off Sitia Bay at 6¼ miles north-northeastward from Cape Sitia. Yanisada, the southern islet, is 485 feet high, while Dragonara, the next north, is 15 feet higher, and the largest. They have deep water all round them, are each about 2 miles long, and can be seen from a distance of about 30 miles. Paximada, the northern, is about ¾ mile long. They extend over a distance of 3¾ miles north and south, are the ancient *Dionysiades Insulæ*, and were once the haunt of pirates.

Digitized by Google

Spitfire Rock.—This dangerous rock, about 12 yards in extent, rising from deep water, and having less than 6 feet water over it, lies nearly midway between the eastern end of Yanisada and Cape Sidero, exactly in the track of vessels running to leeward of the Yanisades, with the prevailing north-northwest winds of summer.

It bears 268°, 3 miles from Cape Sidero, and may be passed northward of by keeping the southern side of Yanisada Islet bearing southward of 266°; on the latter bearing Cape St. John is well shut in. Cape Sidero, in range with the northern side of the islet of the same name near it, bearing 97°, also leads northward of the rock. Mount Mothes, 1,776 feet high, in range with Black Islet (southwestward of Cape Mavro) 190°, leads westward of the rock.

On the southern side of entrance to Port Kereamathi are two small islets about ½ mile apart, 34 and 36 feet high which, when in range bearing 149°, lead very close westward of Spitfire Rock, and therefore the southernmost islet should be kept open to right or southwestward of the northern; these two islets are near, conspicuous, and can not be mistaken.

Coast.—The promontory of Sidero, for 4 miles southwestward of the cape of that name, is very irregularly formed, the northeastern portion being almost divided into two islands by Ports Tenda and Kereamathi, on the northwest side, almost meeting small bays on the opposite side.

Port Tenda, the southwestern of these ports, has a bay in each corner affording shelter with offshore winds, but the distance of 1½ miles between the entrance points of the port exposes it to northwesterly winds.

Rock.—A rock with less than 1 fathom water over it lies 600 yards 18° from the southwestern entrance point of Port Tenda, and eastward 267 yards from this rock is a patch of 4 fathoms. Westward 600 yards from the point dividing Ports Tenda and Kereamathi is the southeasternmost of the two little islets, which, when in range, lead very close westward of Spitfire Rock, and already alluded to.

Rocks with less than 1 fathom water on them lie 300 yards 29° from this islet.

Port Kereamathi is an inlet running in about ¾ mile, and is used only by country boats.

Pinnacle Rocks, above and below water, lie 1¼ miles westward of Cape Sidero, the outer part being ¼ mile from the shore of the promontory.

Sidero Islet, 18 feet high and 50 yards in diameter, lies 1,100 yards 277° from Cape Sidero.

A rock with less than 1 fathom on it lies nearly 200 yards 29° from Sidero Islet.

Digitized by Google

Cape Sidero, the northeastern extremity of the island of Crete, is surmounted by a hill 727 feet high ½ mile southwestward of it. The cape when bearing about 288° appears like an island.

Light.—About 100 yards from the extremity of Cape Sidero is a lighthouse, from which is exhibited, at an elevation of 148 feet above the sea, a revolving light, visible 16 miles. The light is obscured by Elasa Island and by the Yanisades. (See Light List.)

Sidero Reef, consisting of rocks, dry and awash, lies 600 yards eastward of the cape, with a depth of 10 to 15 fathoms between. The reef extends 700 yards in a northwest and southeast direction, and the eastern elbow in the depth of 3½ fathoms bears 86° 1,800 yards from the lighthouse. Northeastward of Sidero Reef are two isolated shoals of 3¼ and 4 fathoms, bearing 77° distant 1.2 and 1.4 miles, respectively, from Cape Sidero Lighthouse. In rounding these dangers the cape should be given a berth of 2 miles; from the westward keep the passage between Dragonara and Yanisada just open, or the extremities of the two islands in range, bearing about 274°, until the eastern extremity of Elasa Island bears 192°.

Port Ioannis is the name given to a small cove on the eastern side of Cape Sidero. The port has a depth of 2 fathoms, and the head of it is distant from the lighthouse about 150 yards. The cove affords shelter to the smaller class of coasting craft, and, being almost screened under the cliffs and hills, was formerly the hiding place of piratical rowboats that lay lurking here and in the islands off it. In the summer and autumn the neighborhood is frequented by numerous sponge boats.

Wreck rocks.—These rocks are awash, and lie with the outer one bearing 136°, distant ¾ mile from Cape Sidero Lighthouse. Lying 700 yards from the shore, they add to the difficulty of attempting the channel between Sidero Reef and the cape.

Dhaskalia Island, 20 feet high, is situated 400 yards off the southern point of the small bay opposite Port Kereamathi, with a 15-fathom channel between it and the shore; shoal water extends nearly 200 yards off its southeastern extremity. In the bay there are depths of 7 to 25 fathoms where a small vessel might obtain shelter in northerly or westerly winds.

Elasa Island.—The flat but high island of Elasa is 1¼ miles in length, and lies with its northwestern extremity bearing 153° distant 2¼ miles from Cape Sidero. On its southern side is a small creek which used to afford a hidden retreat to the piratical craft of modern times and to the galley rover from Algiers in more ancient days.

Coast.—From Cape Sidero the eastern coast of the promontory trends southwestward 4 miles to Eremopoli Bay, thence southward 4½ miles, when it curves eastward 2 miles to Cape Plaka, forming Grandes Bay.

Digitized by Google

Eremopoli Bay is convenient for vessels in the summer months when unable to contend against the then prevailing winds and currents from the northward and bound for Constantinople or into the archipelago from Alexandria or Africa. The anchorage for large vessels is in from 12 to 17 fathoms, at about ½ mile 52° from Black Rock; coasting craft go farther in. The bottom is muddy sand with weed, and fair holding ground.

Grandes Bay.—Kuremeno, 3 miles southward of Eremopoli, is a sandy bay on the northern side of the red conical hill of Palaio Kastro, 292 feet high, and affords good shelter during southerly winds in from 9 to 10 fathoms water, whence it shoals gradually to the shore.

Kuremeno is quite equal to Eremopoli as a place of shelter during the summer gales from north to northwest, and can be quitted without difficulty immediately the gale moderates.

Grandes Islands, in the southern part of the bay of that name and ¾ mile northwestward of Cape Plaka, consist of a narrow islet, 1,400 yards long northeast and southwest, 105 feet high, and a small islet 30 feet high 200 yards off its southwestern extremity.

Grandes Reef.—A small islet, 8 feet high, lies nearly 200 yards from the northeastern end of the large island. From this islet a reef with less than 1 fathom water on it extends 600 yards 52°, and is generally indicated by ripples or breakers upon it.

A well-found vessel will find good shelter with northerly gales southward of Grandes Island, but in not less than 18 or 20 fathoms.

Supplies.—No supplies can be obtained, but partridges are abundant on the hills in the vicinity.

Water.—There is a well of good water above 400 yards from the beach, near the foot of Palaio Kastro Hill, where a vessel might procure a little water in case of need by rolling casks to and from it.

Cape Plaka is a level but high projection of the coast, situated nearly 7½ miles 178° from Cape Sidero. It is the most easterly point in the island of Crete, although less conspicuous as a headland than Cape Sidero. The water is deep close to its eastern side and to within 100 yards of its northern extremity.

Coast.—Caruba Bay, on the southern side of Cape Plaka, likewise affords anchorage with northerly gales, but is subject to strong gusts from the high land over it.

Zakro Shoal, with 9 fathoms on it, is the shallowest part of a bank 4½ miles southward of Cape Plaka and 1 mile from the coast.

Zakro Bay is small, and 6½ miles to the southward of Cape Plaka. Near the village is a small plain confined between precipitous and barren ridges inclosing the valley, and which have all remarkable flat summits and naturally terraced sides, particularly the hill over the northern side of the bay. Zakro is on the site of the ancient *Itanos.*

Digitized by Google

The Kavallos are three rocky islets lying close to a point 4 miles southwestward of Zakro Bay, with deep water close to them. Vessels may anchor northeastward of these islets, at about ½ mile from the shore, in from 12 to 15 fathoms water, on a sandy bottom; but the gusts from the mountains during northerly winds descend with such violence all along this coast from Zakro to Hierapetra that it is not advisable for any wind-bound vessel to bring up here if she can work up to Grandes Bay, or for a sailing vessel even to approach it nearer than 4 or 5 miles, and never with such winds to attempt to pass through the Kupho Channel, for such is the force and suddenness of these squalls that very little canvas can be shown to them.

Kavallos Bay is the name given to the indentation northwestward of Kavallos Islets.

The currents off the eastern end of Crete are variable, but more prevalent from the northwest or southeast, and run at a rate of from ½ knot to 1 knot an hour.

Kupho Nisi, the largest of a group of islets, is nearly 2 miles in extent and comparatively low, its highest point reaching an elevation of only 212 feet. It is less than 3 miles from the eastern part of Cape Guderu, in Crete, and is otherwise remarkable by its white cliffy coast, as this part of the mainland of Crete has no white cliffs.

Sponge Reefs.—Two islets lie off the northern extremity of Kupho Nisi, namely, Makrolo, 40 feet high, and Strongilo, 60 feet high. Extending for a distance of nearly ½ mile northward of them are three detached rocks called Sponge Reefs, only a few feet under water.

Kupho Channel.—Between Sponge Reefs and Prassu Nisia (a small islet 12 feet high 400 yards from the Cretan shore and about 1 mile eastward of the high steep headland of Cape Guderu) is a clear passage 1½ miles wide, called Kupho Channel. About 700 yards westward of Prassu Nisia is a rock awash.

Caution.—It is not advisable for a sailing vessel to anchor northward of Kubho Nisi during a southerly gale, as the wind often shifts so suddenly to the northward that she might find it difficult to get away clear of the shoals lying near them after it has shifted, or be in danger of dragging her anchors during the gusts which would be then experienced.

South coast of Crete (Candia).—The south coast of Crete, having no secure harbor, has no trade except in summer; trade is then carried on by three or four small schooners only, and a few coasting boats. A large part of the produce is transported on mules to the trading towns on the northern coast, where foreign export is alone permitted, so as to prevent smuggling upon this coast. Although there is a quarantine official at Hierapetra, he has no power to give pratique to a vessel coming from any other island or country until he

Digitized by Google

has communicated with the town of Megalo Kastron or Spinalonga, to which latter place the bill of health must be sent by a special messenger, involving a delay of three or four days. Although there are no good ports on the south coast of Crete, there are anchorages off several bays during the summer months or with northerly winds; but the water in general deepens very suddenly, and the bank or ground upon which anchorage can be obtained is generally limited. There are a few dangers also, the most important of which are Kaloyeri Reefs.

Cape Guderu.—From Cape Guderu (ancient *Erythræum* promontory) the coast trends westward, after forming the open bays of Makri-yalo and Kalonero. Off the points which divide these bays there are some shoal patches at from 1,000 to 1,200 yards from the shore, which should not be approached.

On the eastern bank of the river flowing into the sea on the north shore of Makri-yalo Bay and about 50 yards from its mouth is a large monastery surrounded by a high white wall.

Photia Nisi is a small islet, 30 feet high, near the coast, about 11 miles westward of Cape Guderu, and northeastward of the islet is a valley with good water; firewood may also be cut on the sides of the valley. The coast all along this part of Crete is bordered by shallow water and rocks.

Hierapetra.—At 18 miles westward of Cape Guderu is the walled town of Girapetra, or as more generally called by the natives Hierapetra, at the commencement of a small plain that extends along the southern shore of the isthmus of Sitia. It was the site of the ancient city of *Hierapytna*, which attained some size and importance in the time of the Romans and had an artificial port formed by two moles from rude blocks of stone. But the port or ports (for it seems to have had an inner as well as an outer one) are for the most part filled up, and the moles are partially ruined also.

The modern town stands on the site of the inner and choked-up part of the port, and is in consequence low, swampy, and very sickly during the summer months. A loopholed wall, with towers, built by the Turks, inclose it on the land side, and a small Venetian fort, standing on the extremity of the point, commands its sea face. Hierapetra contains a population of 2,000, and has some little trade in oil, the produce of the plain lying to the north and northwestward of the town. The bay on its eastern side affords anchorage in 5 to 6 fathoms on a clear sandy bottom during northerly and northwesterly winds, but it is open and unsafe with southerly winds.

Light.—A fixed red light elevated 30 feet above the sea is shown from the southeastern corner of the customhouse at Hierapetra; it is visible 5 miles. (See Light List.)

Digitized by Google

Gaidaro Nisi.—At 7½ miles south of Hierapetra is the long low island of Gaidaro Nisi, off the eastern end of which is a small conical-shaped islet named Mikro Nisi, higher than the large island, with only a boat passage between them. The island is surrounded by a bank of 30 to 50 fathoms.

Anchorage.—A vessel might run for and anchor northward of the center of Gaidaro Nisi, in the event of being caught too near the land in a southeasterly or southerly gale and unable to gain an offing; but she should approach by the lead and anchor in not less than 10 or 12 fathoms water, and a good ½ mile from shore, as shallow and rocky ground extends more than 600 yards off, but the bottom is a clean white sand beyond. The vessel should, however, be prepared to weigh as soon as the wind veers to west and northwest, as it will soon do, so as not to be caught when the gale has settled in the north, with the island under her lee.

The best anchorage in a southerly gale is in about 8 fathoms at 700 yards 41° from the northeastern point of Gaidaro Nisi, when the center of the small islet Mikro Nisi will bear about 159°. The bottom is fine sand, but holds well if sufficient chain is veered; and in this position, if the wind shifts to northwest or north, it would be practicable for a sailing vessel to put to sea.

Kaloyeri Reefs, lying nearly 4½ miles westward of Hierapetra, extend nearly 1 mile from the point which terminates the eastern spur of the Lasethe Mountains, or from the end of the long olive grove extending along the coast westward of Hierapetra. The reefs have less than 1 fathom water on them and 10 fathoms close to them, and should be given a wide berth.

Keraton Bay, 18 miles westward of Hierapetra, has a more spacious anchorage ground on account of its bank extending farther off the coast, but is not so well sheltered as Sudsuro from the westerly winds and swell. The large town and fertile district of Viano will be seen over the bay; it is the chief town of the district of Arkadia or Rhizo.

Sudsuro Bay, distant about 21½ miles westward of Hierapetra, affords anchorage in from 7 to 10 fathoms water ¼ mile southward of the shingle point, in front of the rocky gorge through which the rivulet that gives its name to the locality. This is an excellent watering place, and abundance of firewood may be also cut along the coast to the eastward of the Anapodari River, a much larger stream than the Sudsuro, and which falls into the sea 1½ miles eastward of it, but not so sheltered for watering. The Anapodari flows from out of the great Messaria Plain, which is the finest district of Crete, and, if cultivated to the extent of its capabilities, would almost meet the annual requirement of grain for the island.

Digitized by Google

As the land over Sudsuso is low in comparison to the mountains on either side and forms a sort of gap between the Lasethe Mountains to the eastward, which are 7,100 feet high, and the Kophino Mountains, 3,750 feet high, which extend immediately over the coast to the westward of Sudsuro, the bay is subject to strong winds during the northerly gales of the summer season, which escape across the island through this gap; the squalls, however, are not so violent as to render the anchorage as unsafe or even inconvenient as under the Kophino Mountains to the westward; the wind being less steady, the gusts are more violent in consequence.

Under the Lasethe Mountains, on the contrary, it is generally calm with northerly winds, the calm extending to a distance of 5 or 6 miles from the land, sometimes more, beyond which the breeze is steady; local calms or squalls are consequently the embarrassments of navigating near the land.

Mount Kophino.—The highest point of the Kophino Mountains terminates in a remarkable horn or pointed crag, 3,750 feet above the level of the sea, which, being seen from a great distance, forms a good landmark for recognizing this part of the coast.

Cape Kephala (ancient *Leon* promontory) is a conspicuous headland 18 miles westward of Sudsuro, and in certain views bears such a resemblance to a crouched lion as to merit the ancient appellation.

The ruins of *Lebena*, once the principal seaport town of Gortyna, are over a small bay immediately on the eastern side of this headland, off which there is an anchorage in from 10 to 12 fathoms. The ancients hauled their vessels ashore under the town. It was celebrated for its temple to Esculapius. The invalid citizen of Gortyna no doubt found relief there from inhaling the pure sea air, and hence the temple.

Kalo Limniones (the Fair Havens, from whence St. Paul sailed previous to his shipwreck at Melira) is a small bay nearly 5½ miles westward of Cape Kephala. It is open to the eastward, but partially sheltered by two islets, St. Paul, and Megalonisi, which lie southeastward and southwestward of it. It is not recommended as an anchorage to winter in; although a vessel well found in anchors and chains, as in the present day, would have a better chance than in the days of St. Paul by securing with stern-fasts to the shore, under the lee of or on the northern side of the islet of St. Paul. With an anchor out to the northeastward in 7 fathoms water and another to the north-northwestward in 8 fathoms, where the bottom is sandy mud and weed and fair holding ground, she would be under the lee and well sheltered. Although the swell rolling round the point of the island during a southeast or southerly gale would be inconvenient, the vessel would not be endangered so long as the shore-fast held.

Digitized by Google

In 1905 the British naval vessel Minerva anchored in 9 fathoms 200 yards 355° from the northeast point of St. Paul Islet.

There is also anchorage in the roadstead with all westerly or northerly winds, in from 10 to 20 fathoms, between St. Paul Islet and Mavro Nisi, the steep black rock or islet, 36 feet high, in the middle of the bay; but between Mavro Nisi and Trapho (lying close to the shore 1,400 yards northeastward of St. Paul Islet) there is a reef extending off 250 yards from the base of a remarkable triangular cliff, which cliff, therefore, must not be approached too closely. On the shore within Trapho Islet was the ancient town of *Lasea* or *Thalassa*.

The narrow passage between the western end of St. Paul Islet and the coast is deep and clear; but the passage between Megalo-nisi (196 feet high) and the shore is obstructed by a shoal of 2¼ fathoms water, lying nearly in mid-channel. The little islet of Papado Plaka, about 200 yards in length, lies 900 yards westward of Megalo-nisi, and at about 150 yards northward of it is a 5-fathom patch. It should not be approached too closely.

Water.—On the western side of the triangular cliff alluded to is a valley with a dry watercourse; but by sinking a well in the beach some 4 or 5 feet deep and not more than 25 or 30 feet from the sea a good supply of excellent water can be obtained. There is no other water in the bay, and the only inhabitants here some years ago were a few shepherds and the guards.

Cape Littinos terminates the Kophino Mountains, at 3½ miles westward of Kalo Limniones, and forms also the southern extremity of the wide bay of Messara or Dibaki. It is a bold and well-defined headland, distinguished by a high wedge-shaped cliff, the cape forming the acute angle of the wedge.

Messara Bay is formed between Cape Littinos and Kavo Melissa, about 13 miles to the northwestward, and from the line joining these two capes the bay recedes 6 miles. The coast for 5 miles northward of Cape Littinos is formed of low white cliffs; and for 5 miles farther on, to the mouth of the Messara Valley, near the village of Dibaki, the shore is low, with a clean sandy bottom off it, decreasing in depth gradually from 20 and 18 fathoms at 1 mile distant.

At Agia Triada, near Dibaki, extensive tombs and the remains of a palace have recently been discovered, all of the Neolithic and Minoan periods.

The northern shore of the bay is the base of the lofty Psiloriti Mountain or ancient *Ida*, which from this point of view presents a long broad-backed summit, and not conical as from the northwestern side of Crete. There is anchorage in any part of the bay in the summer season.

Digitized by Google

Port Matala.—The coasting craft trading with the Messara district generally anchor in a small cove 4½ miles northward of Cape Littinos, there being a more level road from it than from Kalo Limniones. It is called Port Matala, and, although sheltered from the northward, is open to westerly winds, during which the vessels are hauled ashore upon a good beach. This was the other trading port of Gortyna, recognized by the ruins existing there and by its still retaining the ancient name of Metala or Matala, given to it by the ancient authors. The shore cliffs also are perforated with tombs, some of which are below the level of the sea, and show a subsequent depression of the coast as at Spinalonga and Cape Sidero.

The port is nearly 400 yards in length by 250 yards in breadth. A bank stretches off the beach at the head of the port 150 yards; between the edge of the bank and the entrance the depths are from 4 to 8 fathoms. There are two ruined houses close to the beach, and a landing place on the southern side with steps cut in the rock. The cliffs on the south side of the port are about 42 feet and those on the northern side about 150 feet high.

Anchorage.—There is good anchorage off Port Matala in 14 fathoms over fine sand, with the north entrance point bearing 100°, 800 yards, the water shoaling gradually to the entrance.

Landing.—There is also a landing place on the northern side of the point situated about 1,400 yards northward of Port Matala, the road running up the face of the cliff at a steep incline.

Supplies.—Water may be procured at Messara River or at Galines Bay, the outlet of the Amarion Valley, which runs at the western base of Psiloriti or Mount Ida, half across the island.

The Messara district produces a fine quality of wheat, and is capable of tenfold greater fertility and cultivation than at present. It is 25 miles long by 3 to 4 miles wide, dry in general, but with several rivulets intersecting it, and could be made the garden of Crete, as it no doubt was in ancient times, when Gortyna flourished as the capital of the island.

Winds.—The swell from a sea breeze or westerly winds would, however, render communication with the shore of Messara Bay often difficult, and the squalls from Psiloriti with northerly gales strike the bay with great violence. These are very frequent between the months of June and October, known by the native sailors of the Levant as the Meltem gale, their coming or continuance being always indicated by a fleecy bank of white clouds which then envelopes the summit of Psiloriti and some of the neighboring peaks.

In the winter these northerly gales are more violent and the squalls more to be dreaded in consequence, and their effect upon the craft of St. Paul's day, which were only adapted for summer navigation, may

Digitized by Google

thus be easily comprehended; hence the disabled condition of his vessel upon encountering one of these gales after leaving Fair Havens, with the intention of wintering at Phœnice, about 40 miles to the westward of it.

The stormy wind, called Euroclydon in the Acts of the Apostles, and the Meltem of the modern Greek navigator, seem therefore to be identical; for to the Levantine sailor the Meltem is a tempest always to be guarded against, especially from its squalls when passing under any highland, which are often of great force. It is thus possible that its character, and not so much its direction, is meant by the word Euroclydon in the description of St. Paul's voyage by St. Luke; for in the Black Sea and the northern parts of the archipelago the Meltem or northern gales are invariably north-northeast, but in the southern parts and Cretan Seas they are from north-northwest, while in Egypt and Syria they are frequently between northwest and north-northwest.

(The Turkish word Meltem is more usually applied to summer gales; and in the Bosporus it bears a special name, according to the produce of the season, as Kabak Meltemi, Kirax Meltemi, or Cherry Meltem.)

Kalo Limniones is a more tranquil anchorage with these gales than Messara Bay, as in the former a moderate and steady breeze is often blowing, while in Messara Bay it is a strong gale, especially in the beginning of the day, just as St. Paul experienced in crossing it, and as was also experienced in the British naval vessel *Spitfire* on one occasion when leaving Kalo Limniones for the western part of Crete. This circumstance and experience first threw light on the true meaning and character of the Euroclydon of St. Luke.

The Paximadia (biscuits) are two islets lying before Messara Bay. They are high, attaining an elevation of 1,160 feet, and together 2 miles in length east and west; surrounded by deep water, they present no difficulty to the navigation of the bay, but as there is no anchorage near them, they afford no shelter for an embayed vessel. They lie 8 miles northwestward of Cape Littinos and 5½ miles southward of Kavo Melissa, the nearest part of Crete northward of them.

Plaka Bay.—The coast between Messara Bay and Sphakia, about 22 miles westward of Kavo Melissa, has several indentations and bays at the mouths of precipitous valleys, and picturesque gorges, each with a small streamlet of good water flowing out of them to the sea. Anchoring ground can be found off some of them, but that of Plaka and the bays east and west of Franko Castelli alone deserve notice, as being the most convenient and also from having the best water. There is neither produce nor object of interest sufficient to invite a trader or traveler upon this part of the coast, except its

Digitized by Google

picturesque features; moreover, the squalls which descend from the gorges with strong northerly gales are very violent.

Franko Castelli is a ruined Venetian fort on a low point of the coast, off which there is along ledge of rocks forming a sort of natural mole. The rocks inclose a small sheet of water, with from 2 or 3 fathoms water within. Coasting craft use it in the summer season, and there is a local tradition that the Venetians intended to convert it into a safe port for winter use also, had they retained possession of the island.

Sphakia.—The coast town of Sphakia, the capital of a celebrated mountain district of Crete, stands on the western side of a sloping point 5 miles west of Franko Castelli and about 3 miles east of the port of Lutro, which is its harbor. In summer the coasting craft generally lie under Sphakia, at the mouth of a small cove, or are hauled ashore there, preferring it to the shelter of Port Lutro, in consequence of the inconvenience of communicating between it and Lutro by land across the several intermediate gorges and ridges, owing to which it takes nearly 4 hours to cover the ground, although only ¾ hour by sea when fine.

In 1905 the British naval vessel *Minerva* anchored in 15 fathoms sand, and good holding ground, with the western end of the village bearing 5° and Kavo Muros west.

Sphakia always enjoyed a certain amount of independence, and was formerly a town of some size, and possessed previous to the Greek revolution 15 square-rigged vessels and a population of about 3,000, but it has dwindled to a mere village of not more than 80 or 100 houses.

Port Lutro (ancient *Phœnix* or *Phœnice* immediately under the highest part of Madara Vuna, is the only bay on the south coast where a vessel would be quite secure in winter. It bears about 299°, 36 miles from Cape Littinos. The port is circular, open to the eastward, a little more than 200 yards deep and about the same in breadth, with a rocky shoal extending nearly 300 yards eastward from its south point, upon which is the islet of Lutro, sheltering the area on the north. Although so limited, it is said that formerly 15 or 16 small square-rigged vessels belonging to Sphakia used to winter in it, with their sterns secured to the southern shore of the port.

It is represented to be safe in winter, as the southern winds seldom or never blow home against the lofty and precipitous mountains which rise above it and the swell which then reaches the shore is consequently merely a dead swell causing only motion to the vessels without strain to their ground tackle.

The head of the port has a narrow slip of shingle beach in front of a garden, and a few houses, the position of which seems to confirm

Digitized by Google

the statement of the natives regarding the safety of the port; for one of the houses is built within 10 feet of the sea and shows no indication that the swell ever reached its foundations, consequently no damaging sea can exist within the port.

The position of Lutro is best recognized from the sea by the town of Sphakia, the houses of which can be seen several miles off, being the only town besides Hierapetra standing immediately upon the south coast of Crete. The mountains also to the eastward of it are less precipitous and elevated than to westward, for the bald steeps of the Madara Vuna commence their rise just over it.

Anchorage.—The winds most feared by the natives are the northerly gales of winter, during which the gusts descend from the mountains above with hurricane violence. A good cable is therefore necessary from the port bow of the vessel across to the rocks on the north shore of the port, as an anchor in the shallow water would come home. A good anchor and ground tackle also must be laid well out to the northeastward, in not less than 15 or 20 fathoms water, where it would be in firm holding ground and with a steep incline of the bottom to drag against. The stern-fast should also be secured to the quarter of the vessel, so as to allow her to swing off to all northwestern or northeastern gales, as this would greatly relieve the strain.

Pratique.—The captain of the port at Lutro is also the health officer to Sphakia; Lutro and Hierapetra are, therefore, the only places on the south or west coast of Crete where a sanitary passport is officially recognized.

Water.—There are several wells at the head of the port, but the water is slightly saline or mineral, yet not unwholesome, as the natives frequently can drink no other and have even recommended it medicinally, as an alterative and for producing an appetite. There is, however, good water to be procured when there is no swell, from under a high cliff about 1½ miles west of the port, where by simply digging a hole to the depth of a foot or two in the shingle beach under the precipice a strong flow of water is met with, from which the vessels in the port always water when practicable.

Gavdo Island.—This island is about 5½ miles in length, about 3 miles in average breadth, and 1,065 feet high. It is not very fertile, and contains a population of about 100 poor families, under the government of Sphakia. Gavdo is 20 miles southward of Cape Vatalos of Sphakia, and on its eastern side is a roadstead where there is anchorage in from 10 to 20 fathoms water, on a bottom of sand and mud. There is anchorage also close off the southeastern point of the island, to the eastward of Cape Tripiti, in 14 fathoms at 400 yards from shore, and this is preferable with northerly winds to the eastern roadstead, but not with westerly winds.

Digitized by Google

Cape Tripiti terminates the high cliffs forming the southern coast of Gavdo, and is remarkable for three natural arches perforated through its extremity, with a small valley on its east side. The northern side of the island is low and shelving and has shoal ground extending for 600 yards off all its points. There are also two detached rocks lying off the northern extremity—one nearly 1 mile distant with less than 1 fathom on it, the other with 14 feet water on it rather more than 1 mile from the shore, with deep water around them.

Gavdo is the *Clauda* of the ancients and the *Gozo* of the Middle Age and modern navigators of the Levant. It has been dreaded by the mariner for its supposed outlying dangers, but the southern shore is quite free, being bold and precipitous. No other danger than the rocks above described exist around it; nevertheless, the natives have a tradition that a shoal was known to their ancestors, which tradition may have sprung from a biblical source, since the deep soundings around give no indication of a rising of the bottom to lead to the supposition of a submerged bank or quicksand having ever existed anywhere near it as a danger.

The island may, therefore, be boldly approached except at its northern extremity, and the shelter of its lee or the anchorage its roadstead affords may be taken advantage of during a southwest or westerly gale.

Light.—From a lighthouse on the western coast, bearing 290° 1,600 yards from the summit of Gavdo Island, at an elevation of 1,149 feet above the sea, a fixed and flashing white light is exhibited, visible 30 miles. (See Light List.)

Gavdo Pulo, 3¾ miles to the northwestward of Gavdo, is narrow, and upward of 1½ miles in length northwest and southeast. It is 440 feet high, steep-to, has no danger around it nor anchorage, and is uninhabited. Between it and the sunken rocks off the northern end of Gavdo the passage is clear of danger.

Madara Vuna.—The coast westward of Port Lutro is the most picturesque part of Crete. Lofty crags and ridges descend almost abruptly to the sea from the bold and bald summits of the Madara Vuna or White Mountains (ancient *Leuce*), their lower and middle zones being sprinkled with forests of fir and cypress. The growth of these trees is, however, stunted, and more adapted for firewood than timber. The ibex is found upon the mountains and within the forests in considerable numbers. The Madara Vuna rises to the height of about 8,100 feet at 4 miles from the nearest part of the coast.

Temporary anchorages.—The bays, which exist at the mouth of every valley or gorge between Port Lutro and Selino Kastelli, afford no anchorage for a sailing vessel. A steamer may, however, bring up off some of them; namely, at Rumeli and Agios Kyrkos, 5½ and

Digitized by Google

14½ miles, respectively, westward of Port Lutro, at from 300 to 500 yards from the shore, but merely as a temporary anchorage in fine weather.

Suia Bay is in front of a valley about 2¼ miles northeastward of Kavo Flomi, at the western base of the Madara Vuna. From Suia Bay there is a road across to Khania, but there is no anchorage off it. In Agios Kyrkos, a bay about 1 mile to the westward of it, there is anchorage. Both Suia and Agios Kyrkos were the sites of ancient towns and had ports, but they are now within the shore.

Selino Kastelli is the next anchorage on this coast, at 4 miles westward of Kavo Flomi, the point westward of the bay of Agios Kyrkos. The anchorage is sheltered by a low point or plain, at the extremity of which is a flat eminence forming a small peninsula and surrounded by a cliff. At a few miles distant the peninsula looks like an island, and indeed must have been one in historic times, as the coast has been here elevated upward of 20 feet since the ancient authors described it. The walls of a modern fort 6 feet high, built by the Turks on the ruins of a small Venetian fortress, stands on the northern part of the peninsula, and a rugged islet about 40 feet high lies close to its western point, with a shallow passage between. There is a small, conspicuous whitewashed chapel close northward of the fort. On the peninsula are several conspicuous lookout towers, with conical tops, about 14 feet high. Although an important coast station in the time of the Venetians, it has now only a few inhabited houses, situated on the northern part of the peninsula.

Anchorages.—There is anchorage on either side of the peninsula during summer, but the bay on the eastern side of it, being sheltered from westerly winds, is preferable, although it has a deeper and steeper bottom than the bay on the western side.

The British naval vessel *Juno* in 1905 anchored in 16 fathoms in the east bay with the chapel bearing 323° and the left extremity of the peninsula bearing 220°.

A stream of good water issues from the adjacent valley through a line of plane trees and oleanders and flows over a shingle beach to the sea just abreast of the eastern anchorage, which is in from 12 to 20 fathoms water, at 400 or 600 yards from the beach, and on a sandy bottom. The squalls with northerly gales are very violent here, in one of which, however, of great violence, the British naval vessel *Spitfire* steamed in and anchored to await its abatement, and rode securely for three days with two anchors ahead, and without starting either of them, although the bottom is steep.

The western bay affords a longer extent of clean sand and mud bottom, the holding ground is good, and the depth more convenient for anchoring; a small vessel may get well sheltered from west winds under the low rocky point of Trakhili by anchoring off one or two

Digitized by Google

huts on the west side of this bay, where there is also a stream of good water from the adjacent valley, sufficient to supply a fleet. For a vessel merely desiring shelter during strong northerly winds, the western bay of Selino Kastelli is the best to anchor in. The depths in the western bay were reported in 1893 to be less than shown on the chart.

The British naval vessel *Juno* in 1905 anchored in 9 fathoms in the west bay with the chapel bearing 59° and the 40-foot rock 166°.

Cape Krio is the headland forming the southwestern extremity of Crete, and is 4¼ miles westward of Selino Kastelli. It was anciently called *Kriumetopon* or Ram's Forehead, from its supposed resemblance to it; but although a somewhat bold termination of the western mountains of Crete, it is neither high nor remarkable as compared with other points and headlands.

There is a small cove for coasting boats called Port Krio, with a rocky islet off it, at 600 yards northward of the cape, which must be the port *Biennus* of the anonymous Periplus; but the recent elevation of the coast has much reduced its ancient limits and accommodation.

Elaphonisi, or Stag Islet, is a long flat island lying 3½ miles northwestward of Cape Krio, but with merely a boat channel 2 or 3 feet deep between it and the shore. Its western extremity is its highest part, where it is also bold; but on the south side of the island there are dangerous rocky patches extending off it in that direction to and around Low Islet, at a distance of nearly ¾ mile.

Anchorage.—The water at the head of the bay to the east of Low Islet is deep and does not afford very commodious anchorage; but a few steamers could obtain convenient anchorages during a northerly gale in from 8 to 12 fathoms water at 400 yards from the shore, and upon a bottom of sand.

The limited anchorage ground is off a ravine descending from some remarkable white patches on the side of the mountains above, and with Cape Krio bearing about 130°. This anchorage was found preferable with northerly gales to that of Selino Kastelli for temporary shelter, in consequence of being under comparatively lowland and therefore not subject to the violent squalls which are experienced at Selino Kastelli and along the south coast with such winds; but the anchoring ground, as before remarked, is limited, the ground to the westward of it being uneven and foul and to the east of it under the highland much too deep.

Cape Kutri.—The bay and cultivated plain of Akti, 14 miles north of Elaphonisi, about two-thirds along the western coast of Crete from the southward is between two high ranges of hills. At the northern extremity of the bay is Cape Kutri, bluff and cliffy, off which to the southwestward is the rugged islet of Petalides. A reef

Digitized by Google

of rocks named Kutri Reef extends 600 yards from the islet in the same direction, but is separated from it by a very narrow 12-fathom channel.

The northern end of Petalides Islet is separated from the southern extremity of Cape Kutri by a passage 300 yards wide leading into Akti Bay, but it is further contracted by rocky ground extending from either side, and can only be used by small vessels.

Within Cape Kutri are some remains of the ancient town of *Phalasarna;* it was the western port of the neighboring city of *Polyrhenia* and had an artificial harbor, but which is now inland, through an upheaval of the coast in historic times. It has no inhabitants.

Anchorage.—There is anchorage within the islet and reef of Petalides with northerly winds, but the ground is chiefly rocky, with sandy patches between all depths under 12 fathoms. It might, however, be found sometimes more convenient for a sailing vessel or steamer to anchor here than to run entirely to leeward of the island on meeting a strong northeasterly gale at this entrance of the Archipelago, particularly as a sailing vessel would find it difficult to gain the anchorage of Selino Kastelli if the gale was very violent, on account of the heavy gusts and squalls preventing canvas from being set.

Pondiko Nisi, Grabusa Harbor, and the Korykos Promontory, of which latter Cape Kutri forms the southern end, have already been described on page 409.

Digitized by Google

CHAPTER X.

COASTS OF LIBIA (TRIPOLI) AND EGYPT—RAS ASHDIR TO EL ARISH.

Ras Ashdir, the boundary between Tunis and Libia (Tripoli), is low and not noticeable. The 10-fathom curve is about 14 miles northward of the ras, and about 2 miles within this curve are several rocky heads with from 4½ to 5 fathoms water. The coast westward of the ras is described in H. O. No. 151, Mediterranean Pilot, Volume I.

Beacons.—A white pyramidal masonry tower, surmounted by a sphere, 52 feet high, is situated on Ras Ashdir, and bearing 191° leads to an anchorage for small craft off the ras.

A round black metal pile, surmounted by a red cone, 11 feet high, stands on a shoal with 1½ fathoms water about 3 miles 8° from the beacon on the ras.

A round black metal pile, surmounted by a black cylinder, stands in 1¼ fathoms water about ½ mile south-southeastward of the pile just mentioned.

Caution.—The coast between Ras Ashdir and Tripoli has not been minutely examined; caution is therefore necessary in navigation. Vessels proceeding along the coast should keep in depths of over 10 fathoms, and the coast should be approached, or left, on courses at right angles to its direction, at a moderate speed; the lead should be constantly used.

The coast of Libia (Tripoli) trends southeastward 15 miles from Ras Ashdir to the head of an islet, the northern side of which is a low sand strip extending 8 miles west-northwestward to Ras Makhabez. The coast eastward of Ras Ashdir is higher than that westward of it, and shows some small cliffs.

Bank.—A bank, known to the local fishermen as Makhabez Bank, extends, with less than 3 fathoms water, 4 miles northeastward between Ras Ashdir and Ras Makhabez; the 5-fathom curve is from 1 to 2 miles farther seaward.

Ras Makhabez is low and sandy.

Bou Kemesh Bay is an inlet extending about 8 miles east-southeastward within Ras Makhabez; the entrance is 1½ miles wide and the width gradually decreases to the head. A gully with 4¼ to 2¾ fathoms water extends about 2½ miles within the entrance, but access is barred by the shallow coast bank. The bay is frequented by the

Digitized by Google

sponge fishing craft, which obtain good shelter and water in abundance. Fort Bou Kemesh, on the southern shore of the inlet, about 2½ miles south-southeastward of Ras Makhabez, is white.

A mole extends some 328 feet from the shore in the vicinity of the fort and permits fishing craft to lie alongside it even at low water.

Not far from the mole is a ruin called by the natives "Bordj el Agres."

Bou Kemesh Bay is a port sanctioned for the import and export of goods, through the customs, by the Italian Government. There is a land telegraph line to Tripoli.

Beacons.—The channel is marked by posts, those on the eastern side being surmounted by triangles and those on the western side by disks.

Most of the posts are in about 3 feet water, and must not be closely approached.

Ehduz Bank is a group of rocky patches, with from 1 to 2¾ fathoms water. The southeastern extremity of the bank lies 4 miles northeastward from Ras Makhabez, and the bank extends northwestward about 2 miles.

Clearing mark.—Sidi Zultan, open eastward of Sidi Said, leads eastward of the bank.

The coast from Ras Makhabez trends southeastward about 7½ miles, where, on a mound near the head of Bou Kemesh Bay, is Sidi Said, which is 82 feet high and conspicuous; nearly 3 miles southeastward of it is Sidi Ali, also conspicuous; 2½ miles south-southwestward of Sidi Ali is Sidi Zultan.

Shoals.—Several patches, with from 3 to 5 fathoms water, lie within about 3 miles of the coast between Ras Makhabez and Sidi Ali. As this locality has not been thoroughly examined, caution is necessary in navigation.

The coast from Sidi Ali trends southeastward 13 miles to the little port of Zuara, and is low and sandy, with patches of verdure; Zuara Oasis, to the westward of the port, is remarkable. The 5-fathom curve is from 1 to 2 miles off the coast.

Zuara.—The oasis terminates eastward near a dark point, which projects about ¼ mile, and has a marabut on it; the marabut has a double dome, and indicates the position of the port, which is open to the eastward. The town, situated in the middle of the oasis and about 1 mile from the marabut, is surrounded with date palms. There are salt works in the vicinity.

About 5 miles southwestward of the oasis are two tombs, one of which, Sidi Melek, is conspicuous.

Zuara is a port sanctioned for the import and export of goods, through the customs, by the Italian Government. There is a telegraph station here.

Digitized by Google

Shoal.—A shoal, with 1½ fathoms water, extends eastward of the dark point eastward of Zuara.

Anchorage.—There is anchorage off Zuara, in from 4½ to 5½ fathoms, mud, from ¾ to 1 mile east-northeastward of the marabut with a double dome; landing can be easily effected in fine weather on the coast southward of the point.

The coast from Zuara trends east-southeastward about 18 miles to Port Zuaga; it is sandy, and about 8 miles from Zuara is a low conical hillock. Zuaga Oasis lies southwestward of the port. Several rocky heads, with from 1 to 2½ fathoms water, lie from 1 to 1½ miles off this coast, which should be given a berth of 2½ miles.

Port Zuaga, the position of which is indicated by some cliffs, 43 to 79 feet high, on the coast, and the oasis, is a small indentation having several rocks above water off it in places, including two islets about 20 feet high, and shoal water with rocky patches extends nearly ½ mile off the coast in the vicinity. Small craft obtain shelter here.

Supplies.—Good water can be obtained, and some sheep might be procured.

The coast from Port Zuaga trends eastward about 6 miles to Old Tripoli; it is bordered in places by shoals which extend short distances.

Old Tripoli (Marsa Sabrata) is a small harbor suitable for vessels of about 100 tons and less. The village is an irregular group of huts, and the country around is fertile, with a few villages. Near the port is an old tower in ruins.

Tunny fishery.—A tunny fishery has been established at Old Tripoli. It extends, from a rock about 550 yards off the coast, a little more than 1 mile northeastward; it is marked by two floating beacons on triangular bases, each with a mast carrying a white flag moored on the outer side of the body of the net; a white light is exhibited from each of these beacons at night.

The coast from Old Tripoli trends eastward about 20 miles to Sidi Blal, and then turns east-northeastward 14 miles to Tripoli; it is generally steep-to, but shoal water extends about ¾ mile offshore for about 5 miles eastward of Sidi Blal and also westward of Tripoli. The country eastward of Old Tripoli becomes uncivilized and uncultivated; a few houses are visible from seaward.

Caution is necessary when landing on this coast, where there is liability to attack from the Arab tribes.

Sidi Blal is situated on a remarkable conical hill, 285 feet high. Between Sidi Blal and Tripoli there are three marabuts on the coast range—one 2½ miles eastward of Sidi Blal; the next, Sidi Selman, 1½ miles farther eastward; and the third, Ker Kareh, 7 miles still farther eastward. This is a large building near a group of date palms, and is conspicuous.

Digitized by Google

The harbor of Tripoli is situated eastward of the point on which is the town and between the land trending eastward from the southern part of the town and a bank of rocky islets and reefs, named Sibun Shinel, which extends 1½ miles east-northeastward from the northern extremity of the town. About ½ mile east-northeastward from the eastern end of Sibun Shinel a line of reefs commences and trends northeastward, parallel to and at a distance of about 1½ miles from the coast, about 4 miles; Kaliyusha Reef, the southwestern of these reefs, has several rocky heads nearly awash; the sea breaks on the reefs during strong northerly winds.

The outer pass into the harbor lies between the northeastern extremity of Sibun Shinel and the southwestern extremity of Kaliyusha Reef; it is about ¼ mile wide, with 6 fathoms least water.

The outer rocks above water of Sibun Shinel are connected to the coast to the south-southeastward by rocky shoals, in the middle of which is the North Channel; this channel, which leads into the harbor, is about 100 yards wide, with 3¼ fathoms water, between rocky patches of 1½ fathoms on the north and 2 fathoms on the south.

About 600 yards farther south-southeastward is the South Channel into the harbor; it is narrow, with from 2¾ to 3 fathoms water.

In the harbor westward of the rocky shoals just mentioned is a considerable area with general depths of from 3¾ to 5 fathoms; the depths decrease toward the shores, and there are some patches of from 1½ to 2¾ fathoms. The south shore of the harbor is a sandy beach, within which are palm trees for ¾ mile eastward of the castle; it then becomes rocky, with low cliffs for 1 mile farther eastward, and on this rocky shore, which is bordered by a reef of rocks awash, are ruined earthworks, a marabut, a Sultana's tomb with two domes, a fort, and some ancient baths in ruins.

Light—Spanish Fort.—An occulting white light with red sectors is exhibited, at 102 feet above high water, from an iron frame lighthouse on Spanish Fort, situated about 400 yards northeastward of the northern extremity of the town wall; visible 16 miles.

Range lights—Pasha's Castle—Front light.—An occulting red light is exhibited, at 52 feet above high water, from a framework covered with boards painted white and black in bands, on the eastern side of Pasha's Castle. There is a rectangular mark, painted white and black in checkers, on the sea wall below the framework for the light.

Rear light.—A fixed red light is exhibited, at 66 feet above high water, from an iron trellis post, 7 feet high, on a building about 130 yards 233° from the preceding light; visible 8 miles.

Light—Hamidie Fort.—An occulting red light is exhibited, at 75 feet above high water, from a framework covered with boards painted black and white in bands, on Hamidie Fort; visible 10 miles.

Digitized by Google

Lightbuoys—Outer Pass.—A lightbuoy, exhibiting an occulting green light every six seconds, eclipse three seconds, is moored in 7 fathoms water in the Outer Pass, northeastward of the eastern extremity of Sibun Shinel.

A lightbuoy, exhibiting an occulting red light every six seconds, eclipse three seconds, is moored in 6 fathoms water in the Outer Pass, southward of the 5-fathom western extremity of Kaliyusha Reef.

North Channel.—A green lightbuoy, exhibiting an occulting green light every ten seconds, eclipse five seconds, is moored on the north side of the North Channel.

A lightbuoy, exhibiting an occulting red light, is moored on the southern side of North Channel abreast the buoy just mentioned. (See Light List.)

Buoys.—There are two mooring buoys in the harbor, about 750 and 1,000 yards east-southeastward of Spanish Fort.

Moles.—A mole extends 1,640 yards along the reefs northeastward of Spanish Fort, thence southeastward about 546 yards toward North Channel. The head is 88 yards from the range into the inner harbor formed by the two *red* lights in the southeastern part of the town. A mole is to be constructed from the cemetery near Hamidie Fort northwestward to North Channel.

Jetty—Lights.—A jetty extends about 250 yards southward from Setif Rock, which is situated 700 yards east-northeastward from Spanish Fort. Two fixed green lights are exhibited from a provisional mounting near its southern end; visible 1 mile. (See Light List.)

Dredging operations are in progress in North Channel, which channel and a large area in the harbor are to be deepened to 25 feet; some shoals in the harbor are being removed. Vessels must avoid fouling the dredger's moorings.

Anchorages.—There is good anchorage in summer northward of the town, in from 12 to 17 fathoms, with the Spanish Fort bearing about 155° and distant from 800 yards to 1 mile. This anchorage must be quitted on strong winds setting in from the northward.

A vessel awaiting a pilot can anchor inside the Outer Pass in 5 fathoms water, with Hamidie Fort Lighthouse 167° distant about ¾ mile, sheltered from northwest, but open to northeasterly winds. This is a convenient position for entering the harbor.

The best position in the harbor is southeastward of Setif Rock, in from 4 to 5 fathoms; the bottom is chiefly hard sand and indifferent holding ground.

Wharves.—There is a wharf, 350 yards long, with 23 feet water alongside; of this 160 yards has a sea wall, to which vessels of 21 feet draft can make fast; it is furnished with bollards and landing steps. There is to be a depth of 25 feet in the approach. Wharves with a

Digitized by Google

length of 1,320 yards and 25 feet water alongside are being constructed in the southwestern part of the harbor.

Tides.—It is high water, full and change, at Tripoli, at 10 h. 20 m.; springs rise 2 feet. Northerly winds raise the water, sometimes as much as 3 feet.

Current.—The rate of the current in the roadstead is sometimes considerable, but its direction is variable.

Pilots.—A pilot will go off to a vessel making the pilot signal, but no pilot will go outside the reefs in heavy weather.

Directions.—Ker Kareh Marabut open northwestward of the French Fort in ruins on a rocky islet, about 150 yards northwestward of the town, leads northwestward of the reefs to the eastward of the town. Sibun Shinel Rocks, which are above water, may be approached to the distance of ½ mile.

Approach and proceed through the Outer Pass with Hamidie Fort Lighthouse bearing 167°, passing between the lightbuoys, and, if without a pilot, anchor when the south minaret of the town is in range with the lighthouse on the Pasha's Castle, bearing 233°.

To proceed through North Channel keep the south minaret and the rectangular mark, painted black and white in checkers, on the sea wall, or the lights on Pasha's Castle, in range, bearing 233°, but as this mark leads near a 1½-fathom rock on the northern side of the channel, on approaching the lightbuoy steer to pass northward of it. Then gradually bring the range mark on again, and when past a 3-fathom patch, just northward of the course and about 300 yards inside the channel, steer to the anchorage.

To proceed through South Channel keep Hamidie Fort Lighthouse bearing 167°, until the two domes of the Sultana's Tomb appear in range, bearing 195°. Keep this bearing on until the northern side of Spanish Fort bears 274°, which bearing leads to the anchorage.

Or, keep the Sultana's Tomb bearing 195°, as above, until the flagstaff on the northern part of the Pasha's Castle bears 253°, which leads into the harbor in 3 fathoms least water.

At night.—Approach with Hamidie Fort Light bearing 167°, and leave the lightbuoy showing an occulting green light on the western side of the Outer Pass on the starboard hand, and the lightbuoy showing an occulting red light on the port hand. The reefs of Sibun Shinel, and those to the eastward generally, are covered by the red sector of Spanish Fort Light, but the limits pass close to the reefs. When the range lights of Pasha's Castle are in range, 233°, keep them so, but pass northward of the lightbuoy marking North Channel. Continue with the range lights in range until the green lights at the end of the mole extending southward from Setif Rock bear 280°, when steer 260°, and anchor as convenient.

Digitized by Google

Caution.—The buoys are not to be depended on, being sometimes driven from their positions, and the range marks are difficult to make out; therefore, no vessel of large draft should enter the harbor without a pilot.

Landing—Caution.—Landing in boats on the south shore of the harbor is often dangerous during strong northerly winds, and when the sea breaks on Kaliyusha Reef caution is necessary.

Tripoli town (ancient *Æa*), called by the natives Tarables, is situated on a rocky point, and is surrounded by a high wall, with a perimeter of about 1.6 miles, which is flanked by bastions and defended by batteries. At the southeast angle of the wall is the Pasha's Castle, a very ancient building, now the residence of the governor. The houses are poor, and the streets irregular and narrow, but somewhat cleaner than most towns in the Levant. It contains several mosques, the minarets of which are conspicuous, synagogues, bazaars, European hotels, and a dockyard; the population includes Turks, Moors, Christians and Jews, and numbers about 40,000.

The town has four gates—the Bab-el-Bahr or Sea Gate; the Bab-el-Khandak, under the castle wall; the Bab-el-Menshia, close-to; and the Bab-el-Yidid, behind the Jewish quarter. The Europeans live chiefly in the quarter between the harbor gate and the town.

The country around Tripoli is very low and flat; to the westward it is sandy and barren; inland and to the eastward it is thickly covered with palm trees, interspersed with gardens and villages. The general appearance of Tripoli from seaward is striking, the whiteness of the buildings contrasting with the surrounding vegetation.

The chief occupation of the inhabitants of Tripoli is agriculture and making coarse woolen and cotten cloths, mats, and baskets. Some small vessels are built.

Consul.—The United States is represented by a consul and vice and deputy consul.

Trade.—The imports are cloth and cotton goods, flour, sugar, timber, yarn, tea, rice, earthenware and pottery, wine, metals, hoop iron for binding esparto grass, charcoal, etc.; the exports are esparto grass, ivory, ostrich feathers, barley, sponges, cattle, sappan wood, eggs, and mats. Tripoli is a port sanctioned for the import and export of goods, through the customs, by the Italian government.

Jetties.—The Customs Jetty is 120 feet long and 80 feet wide, and the Esparto Jetty is 80 feet long and 40 feet wide; the depth of water alongside both is 8 feet and less.

Quarantine.—The sanitary regulations require all vessels subject to quatantine to perform it at the port of Tripoli, whether their destination be Tripoli or any other port in Libia (Tripoli) territory.

Supplies.—Fresh provisions and fruit of all kinds are abundant; fish and game are plentiful. Good spring water is delivered on board

Digitized by Google

a vessel from tank boats. Water can be procured from a stream on the eastern side of the town, but it is muddy, brackish, has a bad smell, and should not be used. Fine Arabian horses can be obtained, and the cattle, though small, are good.

Coal.—About 1,750 tons of coal are imported annually, and about 465 tons are usually in stock; but all, except 250 tons of coal and patent fuel imported, and 40 tons in stock, is solely for use in esparto grass presses. Coaling is performed by lighters at the rate of about 200 tons a day.

Communication.—A British telegraph cable is laid to Malta and an Italian cable to Syracuse; there is a land line along the coast westward to Bou Kemesh Bay and eastward to Derna.

The coast from Hamidie Fort, on the southern shore of Tripoli Harbor, tends eastward 9 miles to Ras Tajura. It is sandy, and reefs extend from 1½ to 2½ miles off it for 5 miles eastward of the town; thence it is steeper, the 5-fathom curve being about 1 mile off. There are several villages surrounded by gardens on the land between Tripoli and Tajura, and about midway on a point is a marabut. Sidi Delsi, conspicuous, is situated on a hill, in the middle of a barren area, about 2 miles in extent, 8 miles eastward of Tripoli town; between the town and barren area is an oasis. Between the barren area and Ras Tajura a short distance inland, is Tajura Oasis, and Tajura village is close to Ras Tajura.

The coast from Ras Tajura to Ras Sotara, 22 miles east-south-eastward, forms a bay, which extends about 4 miles southward; the country inland is a sandy desert. A stream, the Wad al Ramil, flows through a deep valley into the middle of this bay, and affords good water at all seasons; at its mouth is a remarkable green clump, and Sidi Benmur is near it.

The coast from Ras Tajura to the Wad al Ramil is reddish-tinted sand hills; it is then very low eastward to Ras Sotara. The plains of Juma and Hassan, lying within the sand hills, are partly cultivated and afford good pasture. About 5 miles eastward of the Wad al Ramil the Wad al Demseid flows into the sea, but it dries in summer. The 10-fathom curve is about 1½ miles off the coast.

Stalliman Creek, 2¼ miles eastward of the Wad al Demseid, affords shelter to small craft from northwesterly winds in from 1 to 1½ fathoms water; there are reefs awash and not visible about 200 yards off it. A small marabut, surmounted by a mast, stands on the hill within the anchorage.

Ras Sotara projects ½ mile from the coast; it is low, dark in color, and rises steeply from the sea. The ras is bordered by reefs which extend about 1½ miles westward and ½ mile northward of it, with 10 fathoms water close off them.

Digitized by Google

The coast from Ras Sotara trends 8 miles east-southeastward to Ras al Hamra. A stream, the Wad Ipsi, flows into the sea 1 mile eastward of the ras, and between the stream and Ras al Hamra rocks extend 1 mile off the coast in places.

Tunny fishery.—There is a tunny fishery about 4 miles eastward of Ras Sotara; the nets extend about 1½ miles northward from the shore, but are laid down or removed as required.

Anchorage.—Taxant, about 4 miles eastward of Ras Sotara, affords anchorage in from 1½ to 3 fathoms water for three or four vessels, sheltered by a series of rocks and shoals. It is entered from close to the coast to the westward. Vessels are moored head and stern. The anchorage is used as a refuge by the sponge fishers, who keep a store there. Water can be obtained by digging about 3 feet a little inland.

Ras al Hamra is reddish in color, with a white extremity, which is very low; it is nearly steep-to.

Jebel Tarhuna extends from some 20 miles southward of Ras Tajura to some 10 miles southward of Ras al Hamra; the summits attain heights of from about 800 to 1,300 feet.

Caution.—Vessels off this coast in the evening, and especially during moonlight, should not stand into less than 20 fathoms water, as estimation of distance from the lowland, when in the shadow of the adjacent high mountain range, is very difficult.

The coast from Ras al Hamra trends east-southeastward 15 miles to Ras Elmsel; it gradually becomes higher, forming a succession of rocky points and sandy bays. On the summits of the hills inland are ruins of towers and forts. The country is well cultivated, and there are many villages on it, around which are clusters of olive trees and date palms. It is well watered by several streams, some of which are mountain torrents during the rainy season.

Sidi Abd el Ali is a village situated on the bank of a stream, about 6 miles from Ras al Hamra, in the midst of date palms; around it are several quadrangular forts. There is a small port here where the produce of the country is shipped in summer. Nagazi Stream, which is tolerably wide, flows into the sea through a valley fronted by a sandy beach, 4 miles eastward of Abd el Ali. Eastward of the Nagazi, Jebel Selem slopes to the sea, and terminates in Ras Elmsel, close off which is a group of rocks above water.

Anchorage.—There is open anchorage in from 10 to 12 fathoms water about 1,400 yards eastward of the rocks off Ras Elmsel.

Tunny fishery.—There is a tunny fishery near Ras Elmsel, the net extending rather more than 1 mile north-northeastward. A floating craft, with a mast carrying a white flag by day and a white light at night, marks the outer extremity of the net.

Digitized by Google

The coast from Ras Elmsel trends southeastward 3 miles to Ras Ligata.

A reef of dry rocks extends about 100 yards eastward of Ras Ligata and forms a small port, which is frequented by coasting vessels. There is a stone landing place at the point. Khoms (Homs) or Lebida and Ligata are two small villages a short distance inland.

Around Khoms is a well-cultivated plain, bounded on the north and west by fertile hills, on the summits of which are several ancient towers, the most conspicuous being Jebel Merjed or Merkop. Alfa or esparto grass is largely exported, for binding which there are steam hydraulic presses.

Supplies.—Cattle, sheep, fruit, vegetables, and fish can be obtained from Khoms and Ligata villages, and good water from a well close to the landing place. The inhabitants are civil and inoffensive, and besides cultivating the country, rear large numbers of camels, horses, oxen, sheep, and goats.

Lights.—A fixed white light is exhibited, at 85 feet above high water, from a white circular lighthouse situated about 300 yards westward of the landing place at Ras Ligata; visible 15 miles.

A light is exhibited from the eastern end of a mole under construction at Ras Ligata.

A light is exhibited from a lantern on a stake on the shore at the landing place. (See Light List.)

Khoms Bay.—The coast from Ras Ligata trends southeastward 4 miles to Ras Serik, Khoms Bay lying between.

Khoms Bay is a place sanctioned by the Italian Government for the import and export of goods through the customs. There is a telegraph station here.

Anchorage.—There is anchorage in Khoms Bay, during southerly and westerly winds, off Ras Ligata in from about 7 to 10 fathoms; the best berth is in about 8 fathoms, sand and mud, with the lighthouse bearing 237°, distant ¾ mile. This is a good position for loading or unloading cargo.

Leptis Magna of the Romans, the ruins of which are now half buried in sand, stand on the shore southeastward of Khoms. It was formerly surrounded by strong walls, and with its suburbs was about 4 miles in circuit. The city was divided by a river which fell into the ancient port, at the entrance to which were two strong forts; the port, however, is now filled up and the river is only a small stream. The walls inclose ruins of structures in marble, porphyry, and granite; there is also a profusion of scattered columns and other remains.

The coast from Ras Serik trends southeastward 7 miles to Ras al Tabia; it is sandy, and fronts a very fertile plain on which are a few Arab villages. The 5-fathom curve is about 1 mile off it. A small

Digitized by Google

stream flows into the sea near Ras Serik; on both sides of its mouth are several rocks, and ¾ mile outside them there are depths of 5 fathoms.

Ras al Tabia is rocky and about 40 feet high; there are some rocks at its foot and marshy land to the southward. Wad Khahan flows through a sandy outlet 2 miles to the southward of the ras, and in the bight between is Marsa Ugra (Magra), which is small and sheltered from the eastward by a chain of rocks lying about 100 yards off the beach. It affords indifferent protection to the country boats between the rocks and the main; the southernmost of these rocks are sometimes covered. About 1½ miles up Wad Khahan are the remains of an ancient aqueduct, besides other ruins.

The coast from Marsa Ugra trends east-southeastward about 9 miles to Ras al Zaar. A hill 197 feet high lies 4½ miles southeastward of Marsa Ugra, and between is an indention with 4 fathoms water about 1 mile offshore; the coast then becomes steeper.

Ziliten.—One mile westward of Ras al Zaar is a point on both sides of which are small boat coves, but they are not safe except with the wind offshore.

Vessels load esparto grass here.

Ziliten (Ezliten) village stands a little within a sand ridge ½ mile from the sea. It has a telegraph station, and is a place sanctioned for the import and export of goods through the customs, by the Italian Government.

Fort Pannetone, which is conspicuous, stands on a hill within the coves, and on the summit of the hill there is a high wooden structure; westward of the fort there are two conspicuous groups of palms, and eastward of it are a white stone factory and a steeple, and on a rock jutting out to seaward is a small marabut. Near the coast, and under Fort Pannetone, there is a partly submerged jetty on which the sea breaks; it incloses a small water area, accessible by a passage 13 feet wide, which is used by boats.

Supplies.—Sheep, fowls, butter, oil, fruit, vegetables, corn, and fresh water may be procured in abundance.

Ras al Zaar is a bluff cliff, on which is a marabut; off it are several rocks both above and under water.

The coast from Ras al Zaar trends east-southeastward 14 miles to Ras al Yudi, and is rocky, with hard clay cliffs in places, having a ridge of sand hills behind, whence a fertile plain extends inland to the mountains. On a range of hills 8 miles southward of Ras al Zaar is the conspicuous Sidi Ali, and on the plain below are several ancient forts. The coast from 6 to 13 miles eastward of Ras al Zaar is the remarkable cliff of Daas-mia or Orir, 115 to 130 feet high; there is a cutting near the western end of the cliffs and a small conical hill at the eastern end.

Digitized by Google

The 5-fathom curve is nearly 1 mile offshore for 4½ miles eastward of Ras al Zaar, when the coast becomes steeper; and a rocky bank projects 200 yards off Ras Maeri, 2½ miles eastward of Ras al Zaar.

Ras al Yudi is not noticeable; rocks extend ½ mile off it, and the coast for 1 mile on each side. At 3 miles eastward of the ras the sand hills on the coast rise a little, and on their summit, about 200 feet high, is a small building; between the ras and the building are two small clumps of date palms.

Port Dzeira.—Dzeira (Zoraik) village, stands near the sea 7 miles eastward of Ras al Yudi, and is marked by a cluster of date palms behind the sand hills in the vicinity. A chain of reefs extends in places about 1 mile from the coast between the ras and Dzeira. At Dzeira is a projecting point with groups of rocks within about 600 and 800 yards northeastward and eastward; within these rocks is the open port of Dzeira, with depths of from 1½ to 2½ fathoms, which affords no protection to shipping, although small country vessels resort there for water and provisions. Close outside the reefs are depths of from 4 to 8 fathoms, and 3 miles off 20 fathoms.

The coast from Dzeira trends east-southeastward about 11 miles to Ras Lorug, and is bordered by rocks in places.

Port Titalita, 3 miles eastward of Dzeira, is fronted by rocks, and affords shelter to boats during easterly winds; the coast on both sides is low and sandy, with regular depths off it.

The coast becomes rocky and higher about 1 mile eastward of the port, where the sand hills terminate. Between 6 and 10 miles eastward of Dzeira are three cliffs, which appear to be islands from a distance; the eastern cliff is Ras Misrata, the ancient Trierium or Cephalus Promontory. Misrata town, 5 miles west-southwestward of the ras, is surrounded by olive and palm trees; it is noted for the manufacture of carpets.

Ras Lorug (Zorug) (Kasr Hamet) is a narrow, low, rocky point, with some reddish sand, projecting 300 yards eastward from the coast; the ruins of a tower stand on its outer end.

Surf has been seen ½ mile off the ras, which must therefore be given a good berth.

The shore of the bay to the southward of Ras Lorug rises gradually from the ras, but soon again becomes low, and the shore white sand, within which is a palm plantation. Two low white houses, on one of which is a flagstaff, stand northward of the low white shore. The white marabut of Abu Sheifa stands on a rocky hill, 72 feet high, about ¾ mile southward of Ras Lorug, and where the plam trees end. Marsa Abu Sheifa, the landing place, is near the low white houses, and the boats which take off cargo are often hauled up here. There is a telegraph station here.

Digitized by Google

Shoal water of from 1¼ to 2½ fathoms extends 600 yards off the shore between Ras Lorug and Abu Sheifa Marabut.

Anchorage.—The bay is the anchorage for Misrata town, and is a place sanctioned for the import and export of goods through the customs by the Italian Government. Large vessels anchor about 1 mile westward from Ras Lorug in 7 fathoms, sand and mud.

Supplies.—Sheep, poultry, fruit, vegetables, and good water can be procured.

Communication.—The land telegraph line between Tripoli and Derna passes through Misrata.

Gulf of Sidra (ancient *Syrtis Major*), called by the Arabs Jun al Kabrit (Gulf of Sulphur, from the mines at the head of the gulf), is about 245 miles wide between Ras Lorug and Benghazi, to the eastward, and 113 miles deep; the southeastern part of the gulf is about 90 miles wide. The shores of the gulf are generally low and sandy, and rocky reefs extend off considerable distances in places. The west shore is extensive swamps and stagnant salt lagoons but little above the sea.

There are no ports in the gulf, excepting for small coasting vessels, and these are but partially sheltered. There are encampments of Bedawin Arabs along the shores, at each of which is generally a well of good water, but the land is uncultivated, being marsh, sand, and barren rocks, in places without vegetation or any human habitation.

The sponge-fishing trade is flourishing; the season is from April to September.

Sea level.—A periodical rise of the sea level to the extent of 2 feet occurs on the shores of the Gulf of Sidra; this rise is greater in winter than in summer, and although possibly due to lunar influence it must be partly caused by the prevailing winds in the Mediterranean.

Currents.—Little is known of the currents, but they must not be disregarded; probably the prevailing set is easterly, except when influenced by easterly winds.

Navigation.—There is no particular difficulty in navigating the gulf in a steamer with care and attention to the soundings; sailing vessels should not become embayed, for there is an indraft on both sides of the gulf, and northerly winds cause a heavy sea.

The coast from Ras Lorug trends southeastward 4½ miles to Ras Tatila, and thence south-southeastward about 10 miles to Ras Khara. A marsh extends from Misrata southeastward to Zerafeh, a distance of 100 miles; its northern end is 15 miles broad, but it becomes narrower to the southward. It is level, with isolated mounds of earth and sand, and generally destitute of vegetation, consisting of salt and alluvial deposits; there is one opening to the sea through which at times it becomes entirely inundated.

Digitized by Google

The coast is but little higher than the marsh, and is skirted by a few rocks. A short distance southward of Ras Tatila are some ruins.

Ras Khara is prominent, rocky, and darker in color than the coast in the vicinity.

Shoals.—A patch with 6 fathoms water is situated 6¼ miles 72° from Ras Khara; the sea probably breaks on the patch in heavy weather. Several small shoals, situated 2 miles east-northeastward of Ras Khara, have 4 fathoms water, and 7 to 9 fathoms in all directions within a distance of ¼ mile.

The coast from Ras Khara trends south-southeastward about 50 miles, and thence east-southeastward 45 miles to Marsa Zafran. Two hills, 72 feet high, are situated 7 miles southward of Ras Khara, and 12 miles farther southward is Jebel Melfa, 131 feet high.

Tawaka, an Arab village, is situated about 13 miles southwestward of Ras Khara and close to a considerable plantation of date palms on one of the mounds in the marsh.

Hissa, a small village, is situated 34 miles southward of Ras Khara, and Jebel Jeba, about 3 miles southward of the village, is an isolated mound, with the ruins of an Arab building on it. About 30 miles southeastward of Jebel Jeba is a mound, on which are ruins, close to the beach, the coast between being low; Zerafeh village is 16 miles farther east-southeastward and near the termination of the marsh.

The southwest shore of the Gulf of Sidra is strewn with wreckage, but there is none on the eastern shore, so it would appear that there is an indraft toward the southwestern shore.

Hissa Bank extends 8 to 20 miles seaward from the coast between Ras Khara and Marsa Zafran; at 3 miles from the beach there are from 2 to 4 fathoms water and at 8 miles from 10 to 12 fathoms; the bottom is coral, sand, and weed.

A patch with 9 fathoms water lies about 8 miles southeastward of Ras Khara, and a patch with 7 fathoms water about 3½ miles farther southeastward.

Zerid Rocks.—A rocky reef projects from the beach about 20 miles southeastward of Hissa; Zerid (Jerid) Rocks, on which the sea breaks heavily, lie about 1½ miles outside it and about 3 miles from the beach. Reefs lying 2 miles offshore skirt the coast for some distance on both sides of Zerafeh; the water is smooth inside them.

The coast eastward of Zerafeh becomes rocky and the land higher

Marsa Zabak, about 6 miles eastward of Zerafeh, is a small boat harbor lying within a reef of rocks, above water, which projects ¼ mile to the eastward. The entrance between this reef and a reef, also above water, projecting from the shore is 250 yards wide; inside near the western beach are depths of from 2 to 4 fathoms. Marsa Zabak is suitable only for boats, as the holding ground is bad. There is anchorage outside the harbor in about 8 fathoms water, but the holding ground here is also bad.

Digitized by Google

Marsa Zafran (Sirte) (Port Chebek).—About 11 miles eastward of Marsa Zabak the coast is low and almost without vegetation, but sand hills surmounted by small tufts of trees rise within the beach, at the foot of which is Marsa Zafran, an ancient port once formed by moles and artificial works, the remains of which are above water.

Ruins of massive walls (probably the ancient city of Aspis) and square towers on commanding eminences stand on rising ground on the east side of the harbor.

The ruined fort; an observatory, a high wooden structure situated near the redoubt on the 72-foot height eastward of the fort; two radio masts, also on a height; and the hospital, situated westward of the fort, are conspicuous.

The greater part of the harbor is filled with sand, and it only affords shelter to boats, in from 2½ to 3½ fathoms water. There are two boat passages through the old mole, but with onshore winds the sea breaks heavily on the mole, preventing communication. The landing place is at the western end of the port. The Arabs in the locality are not to be trusted.

Zafran is a place sanctioned for the import and export of goods, through the customs, by the Italian Government.

There is anchorage in 8 fathoms northward of the fort, about 800 yards from the old mole.

Supplies.—Meat and vegetables can be procured from a Bedawin village at the back of the sand hills, and good water from deep wells, but they are about 2½ miles westward of the port.

Telegraph.—The land telegraph line between Tripoli and Derna passes through Sirte, where there is a station.

The coast from Marsa Zafran trends eastward 10 miles, and thence east-southeastward 33 miles to Ras Soldan. There are many ancient ruins in the country, and herds of cattle, sheep, and goats may be seen on the highlands in summer. The coast is low sand hills between Zafran and Ras Denzuaga, 10 miles to the eastward. About 1½ miles inland from Ras Denzuaga is Jebel Beni el Adid, 118 feet high. The coast for about 10 miles eastward of Ras Denzuaga is a succession of low, broken cliffs, with a dark and irregular beach interspersed with frequent spaces of white sand, becoming sandy and fringed with rocks to the eastward.

Jebel Nehua, 11 miles eastward of Jebel Beni el Adid, and 1 mile inland, is 180 feet high. The range from which it rises is level and covered with vegetation of a brown color in summer.

The coast from abreast Jebel Nehua is a succession of red cliffs with intervening beaches of white sand, bordered in places with slate-colored rocks, for 5 miles to the eastward. Jebel Nehua and these cliffs are conspicuous. Thence eastward to Ras Soldan the coast hills

Digitized by Google

are of uniform height and covered with vegetation, green in winter, brown in summer, which reaches nearly to the sea, being separated from it by a narrow sandy beach, bordered by rocky heads which extend seaward 550 yards in places. There are several small creeks, few of which afford landing. The best landing place is said to be on the eastern side of Ras Nahim, which is situated 16 miles eastward of Jebel Nehua, but is not noticeable.

Sultan village lies on the coast about 11 miles eastward of Jebel Nehua; to communicate with the village anchor about 800 yards offshore ½ mile westward of it.

Ras Soldan, the extremity of a headland which projects about 1 mile seaward from the coast line, is about 20 feet high, with an irregular front, and is bordered by a white sandy beach; it is higher than the coast in the vicinity. Medina es Soldan are extensive ruins near the ras, where good water is procurable. A few scattered rocks lie near the ras, the coast here being otherwise bold, with a depth of 10 fathoms at the distance of 1 mile.

The coast from Ras Soldan trends east-southeastward 25 miles to Ras al Omja, and is low and sandy, rising a short distance inland to sand hills, with several salt lagoons between. The extensive ruins of Abu Saida are situated on the coast about midway between, and near which is a red vertical cliff, the color contrasting with that of the other land. There are no noticeable marks except this cliff.

Jebel Mduara, 10 miles west-southwestward of Ras al Omja, is 426 feet high, flattened and badly defined.

Ras al Omja (Cape Likonta) is a bluff, blackish, flat, and steep rock, which from a distance appears like a castle in ruins, but on some bearings it looks separated from the coast. There are two points within about 2 miles southward of Ras al Omja, which appears to be known also as Ras Leueja.

Rocky spit.—A rocky spit, which rises steeply on its northern side from 15 fathoms to from 7 to 2½ fathoms, extends eastward about 4 miles from Ras al Omja.

Marsa Leueja is the anchorage southward of the spit extending eastward from Ras al Omja. There is neither safe anchorage, shelter, nor is landing possible on the coast here in rough weather.

Buoy.—A red buoy marks the southeastern extremity of the shoal off the anchorage of Marsa Leueja.

The coast from Ras al Omja trends southeastward 19½ miles to Ras el Berek, and midway between these points are two black cliffs separated by a sandy beach; elsewhere this coast is rocky and sandy, with a line of low cliffs to seaward, which shows white patches with the sun in the east, but they are not so apparent with the sun in the west.

A shoal with 5 fathoms water lies about 3 miles offshore 11½ miles east-southeastward of Ras al Omja, approximate position.

Digitized by Google

Reef.—A reef has been discovered between 3 and 4 miles from the coast of Libia extending from Ras Leueja to el Berek.

Ras el Berek is a black point rising to three rounded paps separated by low ground.

Jebel Bengahua, 476 feet high, is situated 4 miles inland southwestward of Ras el Berek; the summit is not easily distinguished. The hills of the range are covered with vegetation with some bare spots showing a remarkable red color.

Shoal.—A shoal, with a depth of about 5 fathoms exists about 3 miles offshore and 11 miles eastward from Ras Leueja and northwestward from Ras Bengahua.

Ras Bengahua, 2¾ miles southeastward of Ras el Berek, is a tongue of low land which shows white. Wad Chega, a mountain torrent, flows into a bay southeastward of the ras through a gap which is visible from the eastward. On the hills above the ras are the wells of Kudiya, but the water is not particularly good; here there is a remarkable mound of pure gypsum. There are a few ruined buildings on the heights.

Depths.—There are depths of from 10 to 11 fathoms about 1 mile seaward of Ras el Berek, but off a point between Ras el Berek and Ras Bengahua there is a depth of 5 fathoms at the same distance. There are regular depths of from about 17 to 23 fathoms 5 miles seaward of the coast.

Anchorage, sheltered from west and northwest winds, can be obtained in the bay southeastward of Ras Bengahua, in a depth of 10 fathoms, 1½ miles, or in about 3 fathoms, ½ mile, from the shore; this anchorage is not suitable for sailing vessels.

Landing can be effected on the northern side of Wad Chega; its mouth is faced by a bank of shifting sand.

The coast southward of Wad Chega forms a succession of sandy creeks, separated by rocky points. The coast hills descend gradually from the Kudiya chain, with small intervening gaps. Between the beach and the brown slopes of the hills some black and dull white lines may be seen.

Ras Multaranik is situated about 30 miles southeastward of Ras Bengahua, and the coast from 4 miles westward of to around it is bordered by rocks which have depths of 1¾ fathoms ½ mile and 6 to 9 fathoms 1 mile off it.

Jebel Abu Sha, about 6 miles west-southwestward of Ras Multaranik, is a pap of a ridge of hills.

Ras Ali about 9 miles southeastward of Ras Multaranik, is low and unnoticeable, but from off Ras Multaranik a bare hill appears detached from the coast in its vicinity.

A spit extends 250 yards eastward from Ras Ali; a large rock awash lies 700 yards eastward of the spit, with depths of from 6 to

Digitized by Google

18 feet between. Shoal ground of from 3 to 5 fathoms extends 2¼ miles east-northeastward of the rock, terminating in a rocky head, with 3¾ fathoms water.

The bottom in the vicinity of the spit is sandy, with patches of weed.

Anchorage.—The spit affords no shelter, but a small bay close southeastward of Ras Ali is protected by that portion of it which is awash, and small vessels anchor here, except with winds between northeast and southeast.

Landing can be effected without risk in moderate weather when the wind is northward of northeast. There are several quicksands on the beach.

Kudiya Bank.—Between Ras al Omja and Muktar, a distance of 68 miles, the water shoals gradually to about 1 mile from the shore; the 30-fathom curve is from 7 to 11 miles offshore. The bottom is sand and stones.

Jebel Ali, 5 miles southward of Ras Ali, is two table-lands, 341 feet high. Between Jebel Ali and Jebel Muktar is a remarkable gap in the coast hills.

The coast from Ras Ali trends southeastward and is skirted by low sand hills, the country within being stony and devoid of vegetation to Jebel Muktar, a distance of 8 miles. There is a road from Muktar to the sulphur mines (al Kabrit), said to be situated 1½ days' journey inland, and which gave their name to the Gulf of Sidra.

Jebel Muktar.—The coast hills rise gradually to Jebel Muktar, which is 1 mile inland, 115 feet high, and has some ruins on its summit, but they are scarcely visible.

The coast from Jebel Muktar trends east-southeastward 12 miles to the head of the Gulf of Sidra, 1 mile within which is Jebel Jeriya, conical, and 105 feet high.

Jezirat Abu Sheifa, 11 miles eastward of Muktar and nearly 2 miles from the shore is about ¼ mile in extent, 15 feet high, rocky, with reefs extending about 1 mile eastward and westward of it.

About 3 miles 80° from the island is a rock about ½ mile in extent, awash. The soundings at 1 mile offshore are irregular, varying from 5 to 15 fathoms; within this distance there are several rocks. In the channel between the island and the coast there are about 4 fathoms water, but the channel between the rock awash and the coast has not been examined.

The coast from the vicinity of Jebel Jeriya trends east-northeastward 23 miles to Marsa Brega, and presents a desolate appearance; marsh, sand, and barren rocks alone meet the eye, without a trace of vegetation or inhabitants.

Digitized by Google

Marsa Brega (Bureiga) is a sandy bay open to the northward. The western point of the bay is low and flat, with a hill, 46 feet high, near it, on which is a conspicuous factory, painted yellow; from this point rocks above water and detached reefs extend 1 mile northward. Inland there are very high sand hills. There is a good landing at the western point in the angle between it and the inner detached rock, where sulphur and other produce is shipped. It should be approached from the southeast after giving a berth of 100 yards to the eastern side of the inner detached rock.

Anchorage.—The anchorage is unsafe except with offshore winds. Small vessels anchor in 4 fathoms water about ¼ mile eastward of the northern end of the inner detached rock off the point, and large vessels in 7 fathoms about 2 miles 42° from the point.

Supplies.—Fresh provisions may be obtained from the Arab encampment at the back of the sand hills. Fresh water is procured by digging holes in the sand near the sea, but it is brackish and tastes of sulphur.

The coast from Marsa Brega trends northeastward 13 miles to the foot of Mount Murato, and the hills are covered with verdure. On a bold rocky promontory eastward of the marsa are the ruins of a castle connected by walls, with several ancient excavated chambers and other remains of ancient Roman fortifications on a hill just inside it. Between are two Arab fortresses in commanding situations, and in the vicinity are several Arab encampments.

About 8 miles northeastward of Marsa Brega's western point is a conspicuous white sandstone cliff; eastward of the cliff is a deep ravine, northeastward of which is Lahm el Hinar, a conspicuous peak; a long chain of salt lakes extends up the ravine to Ain Agagna, an Arab encampment. The water at the wells in the vicinity is brackish.

Shoal.—A shoal with 2½ fathoms water, and from 12 to 15 fathoms close seaward, lies about 1 mile northwestward from the white cliff.

The 5-fathom curve in this locality is charted about 1 mile from the shore, with depths of 1 fathom inside it.

Mount Murato is 246 feet high, and its summit is a regular truncated cone; its slopes are brown in summer and green in winter, the coast on both sides of it being arid and white in color.

Jezirat Icheifa, 1 mile off the coast northward of Mount Murato, is ½ mile long north and south, 40 feet high, steep on all sides, and white.

Shoal.—A shoal with 3¾ fathoms water lies 3 miles 260° from Jezirat Icheifa.

The coast, low sand hills partially covered with vegetation, continues northeastward 11 miles from abreast Jezirat Icheifa to a point

Digitized by Google

southeastward of Jezirat Ghara, near the sweet-water wells of Matera; it then continues low, with salt lagoons inside, to the foot of Jebel Chaua, which is 12 miles farther northeastward and 82 feet high.

Northwestward of Jebel Chaua and near the coast is a conspicuous house.

Caution.—Vessels are recommended not to approach the eastern shore of the Gulf of Sidra, between the parallels of 30° 25′ N. and 31° N., within a distance of 8 miles at night.

Islet.—A small islet lies close off the coast 14 miles northeastward of Jezirat Icheifa; rocks above and below water extend 1¼ miles southwestward and 700 yards northeastward from it. The channel between the islet and the coast is foul and should not be used.

Between the islet and Jezirat Ghara there is a clear channel 3½ miles wide, with depths not less than 10 fathoms.

Rocks.—A group of seven rocks, awash, lies 5 miles 341° from Jezirat Icheifa. The group is 150 yards long northeast and southwest and 100 yards broad; the soundings around are irregular, the depths increasing rapidly to 5 fathoms 100 yards from the group except to the southwest, where there are depths of 3 fathoms for 500 yards from the rocks.

At 600 yards around the rocks there is not less than 12 fathoms water.

Hericha or Bird Rocks, 11 miles 9° from Mount Murato, are a group of very low rocks and shoals extending 1 mile north and south; they are surrounded by sunken rocks for a distance not exceeding 600 yards.

The channel between Hericha Rocks and Jezirat Ghara is clear, with the exception of a 5-fathom shoal situated midway between them.

Jezirat Ghara (Legara or Sidre), 14 miles 14° from Mount Murato, is about ½ mile in extent east and west, and rises to two peaks, 56 feet high; its northeastern side is steep. The island is surrounded by rocks, which extend nearly ¾ mile westward of it. Two large detached rocks lie off its southwest point.

Anchorage may be obtained in about 6 fathoms water, hard bottom, a little more than ¼ mile southward of Jezirat Ghara. Small vessels are well sheltered here from northerly winds.

Shoals.—A shoal, with 3¾ fathoms water and 10 fathoms 100 yards around, lies nearly 1 mile northeastward of Jezirat Ghara.

A shoal, with 6 fathoms and about 16 fathoms close-to, lies 5½ miles northeastward of Jezirat Ghara.

Hamud Rocks, westward of Jebel Chaua, are three groups lying from ¾ mile to 1¼ miles from the shore, with which they are parallel. The southern group, which is the highest, is connected to the shore by a shallow spit. The sea to the southwestward of this group has

Digitized by Google

been but little examined. There are, however, two sunken rocks, one ¾ mile, the other 2½ miles, southwestward from this group.

The two northern groups are situated 2½ and 3 miles northward of the southern group, and the space between is obstructed by isolated rocks, with 2½ fathoms water and from 3 to 5 fathoms around. The middle group is about ¼ mile in extent. Some of the rocks are above water, others cover, and others have from about 1 to 1½ fathoms water. The northern group is two low rocks, and others which cover, occupying an area about 200 yards in extent; there are from 3 to 6 fathoms around.

A rocky patch, with 2 fathoms water, lies about 1 mile northeastward of the northern group.

Shoal southward.—A shoal with a least depth of 2 fathoms over it has been discovered near the southern end of the Hamud Rocks.

Caution.—An examination of this locality has shown that the depths are very variable, with numerous rocks; caution is necessary in navigation.

Anchorages.—Small vessels anchor on the southeastern sides of both the southern and middle groups.

On a hill a short distance inland, 8 miles northeastward of Hamud Rocks, is the ruin of a tomb overlooking a large plain covered with brushwood. The ruins of forts stand on two hills to the northeastward of the tomb.

The coast from Jebel Chaua trends north-northeastward, northward, and north-northwestward 26 miles, and forms Bueb Bay. The shore of the bay is arid, bare desert, with no trace of vegetation or inhabitants, except at Marsa Vasili, about 3½ miles northward of Jebel Chaua, where there is a redoubt with a conspicuous trellis wood tower, 98 feet high, used as an observatory, and at Zuitana, 7 miles farther northward, where there are a few palms.

It is skirted by reefs and detached rocks, some of which lie a considerable distance offshore. There are several small bays in which boats could find shelter.

Elfie Rock, 13½ miles, 359°, from the northern group of Hamud Rocks, was found by the steamer *Elfie* in 1910. It is about 4¼ miles offshore, but the position is approximate, and it has been charted as a rock with less than 6 feet water. The sea is said to break on the rock.

Soundings.—The 5-fathom curve is about 1 mile off the southern part of the shore of Bueb Bay and 3 miles off the northern part.

The northern point of Bueb Bay is a low and rocky cliff, and the land within it rises to Jebel Hussein, the three summits of which lie parallel to the shore, the northern summit being situated eastward of the point.

The coast from the northern point of Bueb Bay trends north-northwestward, 8 miles, to Ras Ka Kora. It is low and sandy, rising

Digitized by Google

to sand hills a short distance inland, some of which are covered with brushwood, and within them are large swamps and salt lakes. There are several creeks on the coast where boats shelter, but rocky shoals are reported to extend more than 2 miles offshore in places.

Ras Ka Kora is low and rocky. There are said to be a few trees, palms, figs, and olives, and some huts on it, which are noticeable from the northward. Ka Kora Bay, on the southern side of the ras, is 3 miles wide and 1 mile deep, with depths of from 3½ to 5 fathoms, sand and weed bottom. A line of sunken rocks extends a considerable distance southward from the ras, and shelters a small shallow space, frequented in summer by the boats of the Greek sponge fishers. At 7 miles eastward of Ras Ka Kora is a chain of hills, and on Jebel Mlaga, the summit, are some ruins.

Anchorage, sheltered from easterly winds, can be obtained in from 5 to 10 fathoms with the ras bearing between 0° and 45°. Caution is necessary in navigation in this locality.

Ka Kora is frequented by foreign, chiefly Maltese, vessels, which load with salt produced from the salt swamps, about 1 mile inland; they anchor off the huts, generally in 5 fathoms water, but sometimes in 2½ fathoms for convenience in loading.

Supplies.—Water can be obtained by digging pits in places about 200 yards within the beach. The country is thinly inhabited, and no supplies, excepting what may be procurable from groups of stragglers, are obtainable; but northward of Ka Kora Arab encampments are numerous, and hares, partridges, pigeons, etc., abound on the hills.

The coast from Ras Ka Kora trends northward 30 miles to Ras Teyonas. It is low, sandy, and within it is an arid chain, not exceeding 80 feet in height. There are no habitations. Inland the hills are covered with vegetation, and on some of the summits are ruins of forts or buildings. An isolated castle stands on Ghemines Hill, 12½ miles northward of Ras Ka Kora. There is a new village on the summit of this hill, where there is a palm grove. Mekali, a ruined fort, 1½ miles inland and 15 miles northward of Ras Ka Kora, is noticeable, as are also the three palms on a point 6 miles farther northward.

Beacon.—A truncated quadrangular pyramidal beacon, painted black and white in horizontal stripes, 14 feet high, and surmounted by an iron post 8 feet high, stands on a yellow sand dune near the coast to the westward of Ghemines Castle. From a distance northward and about 1 mile offshore the beacon appears in the sea.

Ras Teyonas is low, sandy, and salient. Abu Takra Marabut, on the side of a hill about 2½ miles southeastward of the ras, is conspicuous, and the village 3 miles southward of the marabut shows well from seaward.

Digitized by Google

Shoals.—A shoal, with 1 fathom water, sand bottom, lies 2½ miles south-southwestward of Ras Teyonas and 1 mile offshore.

A shoal, with 1 fathom water, was reported in 1874, by the steamer *Bullfa*, to be situated about 5½ miles, 272°, from Ras Teyonas. The shoal was unsuccessfully searched for by the British Naval vessel *Torch* in 1874. It was again reported in 1878 by the Maltese brigantine *Regina Vittoria*, and the locality was subsequently examined by the U. S. S. *Gettysburg*, but no shoal water was found. Shoal water was again reported in this locality in 1904.

Soundings.—The depths within 2 miles from the coast in the vicinity of Ras Teyonas are irregular. There are shoals, with 2½ fathoms water, 1½ miles offshore, and others with 1½ fathoms 1 mile off. The bottom is generally sand, with patches of seaweed and some rocks. The depths fall quickly from 15 to 6 fathoms, and generally a vessel of about 15 feet or more draft should not close the coast to depths less than 10 fathoms.

The coast from Ras Teyonas trends northeastward 9 miles to the southwestern entrance point of Marsa Juliana, the port of Benghazi; it is low and sandy. Northeastward of Ras Bushaiba, which is situated about 1 mile south-southwestward of the southwestern entrance point of Marsa Juliana, is a small oasis with some palm trees.

Between Ras Teyonas and Benghazi, at distances of from 5 to 8 miles from the shore, depths of from 30 to 45 fathoms were maintained by the *Gettysburg*. The 5-fathom curve is from 1½ to 2½ miles offshore.

Shoal.—The Royal Italian vessel *Flavio Gioia* reported, in 1912, a shoal, with 2¼ fathoms water, situated with Ras Teyonas bearing 198°, 4.8 miles.

Abu Shaiba Reef.—From about 400 yards off Bushaiba Point Abu Shaiba, a reef of sunken rocks, extends 600 yards westward.

Benghazi (**Bengasi**) stands on the extremity of a low point nearly surrounded by salt lakes and marshes, the latter being often inundated during northerly gales. The lakes are separated by mounds and ridges of sand of from 30 to 40 feet in height, on some of which are groups of buildings or marabut tombs, and in the vicinity are clusters of palm trees remarkable from their being the only trees of that description found on the coast westward of Derna for several hundreds of miles, except those mentioned on page 468.

Monument.—A conspicuous monument to the memory of the Italians who fell in the attack on Benghazi in 1911 has been erected on the southern point of the entrance.

Marsa Juliana, the port of Benghazi, southwestward of the town, is formed by reefs of rocks which extend off the southwestern sandy entrance point, on which is a conspicuous monument, and the

Digitized by Google

castle, 1,050 yards to the northeastward. About 300 yards northwestward of the reefs off the southwestern entrance point, with Bogaz el Juliana, a 2-fathom channel, between, is Diamanta Petro, a rocky reef, 3 feet high, which extends nearly 200 yards northwestward. Between Diamanta Petro and the reefs off the castle is Bogaz el Grandi, which is about 200 yards wide between the 3-fathom curves, but much obstructed by rocks. The depths in the marsa decrease to 2 and 1 fathom, but there are large areas with less than 1 fathom water, and there are several detached rocks. Only very small vessels can enter, even with the aid of a pilot. The sea frequently breaks right across the entrance, and the port affords no shelter in winter.

Formerly the port was much more capacious, and large vessels could anchor where now only boats can float. In the small sheltered spots there are now only from 1 to 2 fathoms water, and the whole of the port is fast being filled with the sand and alluvium brought down by the heavy rains which annually deluge the country from January to March. The head of the port communicates by a narrow channel with Lake Sibba, a large sheet of water, in which there are from 5 to 6 feet water.

The northern mole extends about 180 yards westward from the point westward of the castle, over the reefs; it then turns south-southwestward about 230 yards. The under-water portion of the mole extends about 21 yards beyond the light and vessels should not approach closer than this.

The southern mole is planned to extend about north-northwest, 360 yards, and thence north-northeast, 340 yards from the western entrance point, and over the reefs which form the southwestern side of the port. It is not yet commenced.

When these works are carried out, the entrance to the port between the heads of the moles will be open west-northwestward.

Depths—Anchorage.—The work of dredging the harbor has been completed and there are now two anchorages, one behind the mole with depths of 12½ to 16 feet, the other behind Juliano Peninsula. The anchorage behind the peninsula is reached by a curved dredged channel about 100 yards long with depths of 9¼ to 16 feet.

The depths in the entrance to the harbor between the range line and the mole head vary from 14 to 16 feet, and those between the range line and the piles to the southward from 9½ to 14½ feet.

There are piers on the northeastern side of the marsa, but they are only available for very small craft.

The wharves have been improved and fitted with appliances for dealing with cargo. A channel, about 300 feet wide, with a depth of 13 feet, has been dredged to the southern part of the harbor.

Digitized by Google

Lights.—A flashing white light is exhibited, at 72 feet above high water, from a white masonry tower, 39 feet high, with a wall round its base, on Ras Tahun ta Ria. Visible 14 miles.

A red light is exhibited 35.4 feet above high water, from a red metal trellis turret, on the head of the mole. Visible 6 miles.

Range lights.—Front light, fixed red, visible 7 miles, exhibited 26 feet above the sea, from a white cylindrical structure, on the eastern side of the harbor, about 782 yards 116° from the light on the head of the mole.

Rear light, fixed red, visible 6 miles, exhibited 42 feet above the sea, from the top of a cement reservoir painted with a black vertical stripe and a white base, on the shore, 183 yards 106° from the front light.

The black stripe in line with the white structure of the front light, or lights in range, lead into the harbor.

The green light shown from the beacon northward of these lights has been discontinued.

Caution.—(1916) The above range lights lead close to a shoal.

Until further notice entering vessels should keep somewhat to the left of this range.

Light.—A light is occasionally exhibited from the head of the military pier. (See Light List.)

Buoys.—A red can buoy is moored on the eastern side of a rock with 4 feet water, situated 400 yards west-southwestward from the mole head.

Posts.—Groups of posts, red and black, mark the limits of the channels to the piers. For their positions see the chart.

Caution.—The buoys and posts are liable to be washed away.

Anchorage.—The best anchorage off Benghazi is from ½ to ¾ of a mile northwestward of the castle in from 9 to 10 fathoms, sand and weed, and with Sairet Ben Ghisa minaret bearing about 107°. Southwestward of the town the bottom is broken and rocky, and the coast should not be approached within 1½ miles. Sairet Ben Ghisa minaret (in the middle of the town) and Algharib marabut in range, 64°, when they are just open northward of the castle, lead northward of the rocky ground southwestward of Diamanta Petro.

The strong westerly winds, which blow almost constantly from November to the end of February, cause a very heavy sea, which renders the anchorage dangerous. During this period it is scarcely possible to remain at the anchorage, and communications with Europe are nearly completely interrupted. In the fine season numerous steamers arrive and load with cereals for England and the archipelago.

Prohibited anchorage.—Mariners are cautioned not to anchor within the area comprised between two lines drawn in a 315° direction,

Digitized by Google

for a distance of 6 miles, from points on the shore situated, respectively, 283 yards northeastward and 373 yards southwestward of Tahun ta Ria Point Lighthouse.

Landing.—Eastward of the mole there is a landing stage in front of the customhouse and a sea wall on which goods are unloaded. These are approachable by boats and lighters; the depth alongside is 3 feet, but only part of the customhouse pier, which is 180 feet long, is available. Caution is necessary in steamboats.

Signal station.—There is a signal station about 200 yards eastward of the inner end of the mole.

Pilots.—A pilotage service is established at the port of Benghazi, and pilotage is compulsory for merchant vessels over 50 tons when entering, leaving, or shifting berth in the port.

The pilot, in answer to the pilot signal, will meet and anchor a vessel off the port, or take her to an anchorage in the port.

The pilot's boat is painted black, with a white band, and the word "Pilota" on each bow. The boat carries, by day, a square flag, divided horizontally into three equal parts, of which the middle is white with the letter "P," and the others blue. The sail has the letter "P" in the middle.

Directions.—In summer northeast winds prevail on this coast. During the day they are fresh, but moderate toward evening, when the land breeze sets in. The currents follow the direction of the wind, and with strong winds attain a rate of 3 to 4 miles an hour, but they are not felt more than some 25 miles from the land. As northeasterly winds are felt as far as 40 miles from the land, vessels bound to Benghazi should make the land to the eastward of the port, or they will be carried to the southwestward by the strong current which with these winds set along the shore into the gulf.

When approaching the port, the high land 14 miles eastward of it, on the summit of which is a tower, first becomes visible, and on a nearer approach the palm trees in the vicinity of the town and the windmill on its northern side, near the lighthouse, may be seen, but the sails of the windmill have been removed. Sairet Ben Ghisa minaret rises above the town and is conspicuous.

Boats from the roads enter the port with the black stripe on the white reservoir of the rear range light structure in line with the white base of the front light structure bearing 106°. When southward of the light turret on the mole, and of a group of red posts situated 100 yards southward of the molehead, turn northeastward, leaving the two groups of red posts nearest to the mole on the port hand and one group of black posts on the starboard hand, to the civil or the customhouse pier. The least depth by this route is 1¼ fathoms.

Digitized by Google

If proceeding to the military pier, leave all the groups of red posts on the port hand and the eastern group of black posts on the starboard hand.

The town, situated on the site of the ancient city of Berenice, the westernmost city of the Pentapolis, is poorly built of undressed stone, with mud and lime cement. The population is about 25,000 and consists of Arabs, Greeks, Maltese, and a few Levantines. Sairet Ben Ghisa is a mosque with a high minaret, situated in the middle of the town. In the western extremity of the town is the gasar (castle) in ruins, only the north tower, surmounted by a signal mast, remaining visible. Remains of ancient moles can be traced among the rocks westward of the gasar. On the rising land northward of the town, and on Ras Tahun ta Ria, are Sidi Sima and Sidi Kreibish, which are noticeable from seaward.

Large buildings of recent construction, having the appearance of barracks, are situated about 2¾ miles southeastward of the town on a low hill behind a salt lake between the roads to Tripoli and Derna.

Northeastward of the town is a forest of date trees, beyond which flat stony plains extend to the mountains. The quarries from which the stone was procured for building the city of Berenice are a short distance eastward of the town. Near them are some remarkable pits of considerable extent, converted by the Arabs into gardens. The famous gardens of the Hesperides, and the River Lethe, or River of Oblivion, were probably in the vicinity of Benghazi.

Climate.—The climate of Benghazi is mild and healthful. There is no trace of malaria; Malta fever, typhus, and dysentery are very rare. Italians residing here carry on similar kinds of work, including agriculture, to those they were accustomed to in Italy.

Trade.—Benghazi is a place sanctioned for the import and export of goods, through the customs, by the Italian Government. The exports are wool, hides and skins, sheep, goats, horses, and camels; the imports are cotton cloths, sugar, wine, drugs, oil, tobacco, woollen goods, planks, etc. Trade much depends on the rainfall.

Loading and discharging are carried out by lighters towed by tugs. Anchorage dues are charged.

Supplies.—Fresh meat, vegetables, and soft Arab bread are plentiful; fruit is scarce. Water, good but slightly brackish, is obtained from Sabri wells, and is supplied in barrels alongside in boats. Ship chandlery stores are of very inferior description.

All articles, even liquids, are sold by weight, except barley and wheat, which are sold by measure. The sah = 23½ gallons and the chilo = ⅓ sah; the oke = 40 ounces or 2½ pounds avoirdupois; the kantar = 50 okes or 142 pounds.

Coal.—There are usually about 100 tons of coal dust in stock.

Repairs.—There are scarcely any facilities for repairs.

Digitized by Google

Communication.—A telegraph line along the coast between Derna and Tripoli passes through Benghazi.

There is a telegraph cable between Benghazi and Syracuse.

The coast from Benghazi trends northeastward 20 miles to Ras Adrian and is low and sandy. A fertile and well-wooded plain extends inland to the foot of the mountains, which extend in a continuous chain, with an elevation of from 800 to 1,000 feet, along and gradually approach the coast. Several deep ravines, the sides of which are clothed with pine, juniper, and other shrubs, wind down toward the sea, and contain water in the rainy season. There are numerous ruins of towers and other buildings on the plain and surrounding heights, and narrow salt lakes extend parallel with the coast behind the sand ridges for 6 miles northeastward of Benghazi.

Caution.—Between Benghazi and the vicinity of Derna the Bedouin are treacherous and thievish, and it is necessary to land armed and, if possible, in force; farther eastward they are peaceful.

Ras Adrian, on which are some ruins, is bordered by a few rocks on both sides, which extend about ¾ mile offshore. About 4 miles inland, southward of the cape, are the conspicuous ruins of a tower.

Lipsos Shoal, 4 miles, 5°, from Ras Adrian, is 150 feet long and 30 feet broad, with about 3 fathoms water. The bottom appeared to consist of very soft stone covered with shells. There is a depth of 9¾ fathoms between this shoal and the shoal water off the coast.

The coast from Ras Adrian trends northeastward 14 miles, to the ruins of the city of Taukra, and is low and sandy, with a chain of brackish-water lakes inside it.

The Arab encampment of Berss or Birsis (where there are wells) and the ruins of the town of Mabli are on the southeast side of the lakes. There is a white marabut a short distance inland about 3 miles southwestward of Taukra. The ruins of Taukra (ancient Teuchira) stand close to the sea on slightly elevated ground which terminates in a cliff. The massive walls which inclosed the city are about 1½ miles in circuit. The old castle, painted yellow, is the only building noticeable from seaward. Outside the walls on both sides are many large quarries and ancient tombs, which in summer are turned into habitations by the Arabs who then frequent the town.

The coast from Taukra trends east-northeastward 24 miles, to Tolmeita, and is low and sandy, the country inland being well cultivated in places.

Caution is necessary in navigation on the coast between Benghazi and Tolmeita as there are several rocky shoals, on which the sea breaks, from 1 to 1½ miles off it; with deep water close outside them.

Tolmeita, the extensive remains of the ancient city of Ptolemais, is situated on a plain close to the sea at the foot of a high range of hills. It was formerly inclosed by walls of about 4 miles in circuit, of

Digitized by Google

which now only the foundations can be traced. There are, however, numerous vestiges of its prosperity, including a theater, amphitheater, Christian church, gateway, and several handsome columns, all in a tolerable state of preservation. Outside the walls are large quarries, in the sides of which are excavated tombs. The ancient port, or kothon, was formed between an elevated rocky point and a chain of high rocks eastward of it. Around the shore are the remains of a sea wall, at each end of which is a fort. About ½ mile southwestward of the point on the western side of the kothon is a rocky point, and along the beach between are also remains of wharves and walls. Although the port is nearly filled with sand, it still affords shelter to boats, and is by far the best landing place on the coast westward to Benghazi. Zarat, a small high rocky islet, about 400 yards eastward of the point on the western side of the kothon, is steep-to on all sides. A small white stone pyramid stands on a hill about 2 miles southeastward of Tolmeita.

There is said to be a depth of not less than 16 fathoms ½ mile off the coast in the vicinity of Tolmeita.

Water is obtained by the Arabs from the ancient reservoirs, many of which are in good preservation.

Approach.—From the north-northwestward, when about 9 miles distant, a ruined tower may be seen on the shore about 1 mile west-southwestward from the city, and 1 mile farther southwestward a small white marabut with two cupolas, near which is a very high palm. From nearer the coast the ruins of the amphitheater are conspicuous.

Light.—A group flashing white light is exhibited, at 82 feet above high water, from a metal mast with hut, all painted red, on the summit of the point on the western side of the kothon; visible 10 miles.

There is a flagstaff near the lighthouse. (See Light List.)

The coast from Tolmeita trends east-northeastward 12½ miles, to Ras Tolmeita, and is steep and broken by the ravines from the highland. At 4½ miles offshore, between Tolmeita and the ras, the depths are from 150 to 200 fathoms, the bottom being very uneven and shoaling to 40 fathoms very quickly.

Rocks.—A rock, on which the depth has not been ascertained, lies about 3 miles 40° from Tolmeita Lighthouse and 1 mile offshore. It has been charted as a rock with less than 6 feet water.

There is said to be a reef above water about 1 mile offshore 4 miles northeastward of Tolmeita, with breakers between it and the land.

The coast from Ras Tolmeita curves eastward and northeastward 27 miles to Ras al Hamama, and is steep and rocky, rising to the Beni Jidem Range, which attains a height of 1,051 feet some 7 miles southeastward of Ras Tolmeita.

Digitized by Google

Ras al Hamama, the ancient Phygus promontory, is low and not easily distinguished from seaward. The land to the southward is high, with deep ravines. About 1¼ miles southward of the ras is a conspicuous white marabut.

The coast from Ras al Hamama trends eastward 5½ miles to Ras Sem, and is high, and broken by deep ravines which extend a long distance inland.

Ras Sem is high and bold, having behind it two ranges of hills rising one above the other, on the highest of which, about 10 miles south-southeastward, are the ruins of the ancient city of Cyrene, 2,012 feet above the sea. This city (called by the Arabs Gureina), formerly so celebrated for its wealth and splendor, is situated on a splendid site in a beautiful and well-watered country. The fine springs from which it derives its name are as abundant as ever.

Sailing vessels bound to Alexandria in summer usually make Ras Sem, where the prevailing northerly winds turn, on the coast to the westward to northeast, and on the coast to the eastward to northwest.

The coast from Ras Sem trends east-southeastward, 12 miles, to Marsa Susa, and continues high and bold. A little eastward of the ras is a ravine with a stream of fresh water, which flows from the fountains of Cyrene; it also contains an abundance of firewood.

There are several rocks above water close off the coast.

Marsa Susa extends about 1,200 yards eastward from Ras al Susa, the western extremity of a small promontory. The kothon is a small bight on the eastern side of the promontory. Hammam and Sharkea Rocks, two small islets, lie nearly 400 yards off the town. Boats may find some shelter behind them, but the ground generally is foul, with numerous rocks. The extensive ruins of the ancient town Apollonia, which are still in a good state of preservation and are noticeable from seaward, stand close to the beach on rising ground, within which a fertile plain extends to the foot of the hills about 1½ miles inland. There is much grain cultivation in this district. Hares, partridges, and pigeons abound.

The sea here has encroached very considerably on the land. The former importance of the town is indicated by the remains of a massive wall, which surrounded it, a theater, Christian churches, etc.

Lights.—An occulting white light is exhibited, at 115 feet above high water, from a metal hut, painted black and white in horizontal stripes, on a white masonry base, which has "Susa" painted in black letters on the two seaward sides, situated on a small hill on the southeastern side of the kothon. Visible 8 miles.

A fixed white light is exhibited from an iron support on the western side of the entrance to the kothon. (See Light List.)

Digitized by Google

Beacon.—A white wooden support, surmounted by a white triangle, stands on Tomb Rock, which is situated in the central part of the bight southward of Ras al Susa.

Le Seignelay Patch, on which the French naval vessel of that name struck in 1888, is situated about 400 yards northward of the point westward of the kothon, and is about 200 yards in extent east and west, with from 3 to 4½ fathoms water, rocky bottom, and 6 fathoms close-to.

Buoy.—A buoy without a topmark is moored on the northeastern side of Le Seignelay Patch, 480 yards 303° from the southwestern extremity of Hammam Rock.

Shoal.—A shoal, with 1¾ fathoms water, lies about 200 yards northward of the northwestern point of Hammam Rock.

Anchorage.—There is open anchorage westward of a line between Ras al Susa and Le Seignelay Patch.

Harbor works.—A mole is to be constructed at Marsa Susa.

The coast from Marsa Susa trends eastward and northeastward 10 miles to Ras Zawani, and then turns east-southeastward 2 miles to Ras al Hilil. It is generally high and bold.

Breakers extend upward 1 mile offshore about 3 miles eastward of Marsa Susa.

Ras al Hilil, or New Moon, so named from a round hill on the range within it, is a comparatively low rocky projection, which extends 1½ miles from the foot of the mountains. Rocks extend about 200 yards off it. In winter a waterfall about 2 miles southward of the ras is noticeable when on westerly bearings.

Marsa al Hilil, about ¾ mile southward of Ras al Hilil, is a bay, which affords good shelter in from 6 to 10 fathoms, sand and weed, from winds between north-northwest, through west, to south, but a heavy sea rolls in with northerly and easterly winds.

In 1893 the *Davout* anchored in 25 fathoms water ¾ mile 90° from the observatory, where the chart shows 14 fathoms. Soundings taken ¼ mile around the vessel gave similar differences. There are depths of 4 fathoms 700 yards, and 5 fathoms 900 yards, eastward of the observatory.

The shores of the bay are rocky cliffs, broken by two small bights, where there are large caves, which are conspicuous from seaward. On the southern shore, which is high, is a spring of good water, at the back of which are the ruins of the ancient city of *Naustathmus*. Some white bowlders can be seen from seaward over the trees, which are thick here, and in the valleys to the eastward.

The coast from Marsa al Hilil trends southward 1 mile, and then turns eastward 11 miles to Turba. It is rocky and the landing bad, except in a small sandy nook about 2 miles westward of Turba. About 5½ miles eastward of the marsa is Waaila Trum, where a fine

Digitized by Google

stream of water falls into the sea from a deep ravine, the sides of which are covered with pine, cypress, and olive trees.

The coast from Turba trends east-southeastward 16 miles to Ras Boasa; it continues rocky, but the ravines are fewer and the mountains are farther inland.

Jezirat Tzor Kersah, about 7 miles east-southeastward of Turba and 1½ miles offshore, are a group of two small islets, with rocks extending about 1 mile to the northward and eastward. The passage between the islets and the shore must not be used for navigation.

Ras Boasa is bordered by rocks and shoal water. The 5-fathom curve is about ½ mile to the northeastward. There is a conspicuous marabut on the ras.

Light.—A flashing white light is exhibited, at 92 feet above high water, from a lighthouse, 37 feet high, on Ras Boasa. Visible 5 miles. (See Light List.)

Derna (ancient Zephyrion).—Nearly 1 mile southeastward of Ras Boasa is a low shingle point, and rocks extend about ½ mile off the coast between the ras and point. Derna Bay, southward of the shingle point, is small and affords shelter from westerly and southerly winds.

Mole.—A mole extends about 330 yards southeastward from the low shingle point.

Light.—A fixed green light is exhibited from an iron support on the head of the mole. It must not be closed to less than 90 yards, owing to obstructions caused by materials shifted by the sea. (See Light List.)

Buoys.—Four conical buoys, painted red and white in horizontal stripes, mark the 3-fathom curve at Derna, but they are liable to drift. (Carried away, 1916.)

Pilotage.—A pilot will, on request by the pilot signal, indicate the most convenient anchorage for vessels arriving, by showing the pilot flag, or at night a red light at intervals, from his boat, placed where the vessel should anchor. At night the pilot only goes out to meet those steamers which have previously asked for his services and of which the approximate time of arrival is known. The service is not compulsory, but the harbor master can require a vessel to shift berth, or may direct the pilot to take charge. The pilot will also assist vessels at anchor or in leaving.

Anchorage.—The best anchorage for large vessels appears to be about ¾ mile offshore, in from 7 to 9 fathoms, sand and coral, but small coasters lie close inshore, where they obtain shelter from north-northwest, through west, to southeast winds, but there is no shelter from northerly and easterly winds, except such as may be given by the mole. The vessels trading between Derna and the Grecian Archipelago winter at Bombah.

Digitized by Google

Pier.—The landing pier about 270 yards southwestward of the mole has become useless, and the light formerly exhibited from the head of the pier has been discontinued.

There is a landing place in a sandy bay formed by a low point, off which are some rocks about ½ mile eastward of the town.

Signal station.—There is a signal station near the inner end of the landing pier for the use of vessels at the anchorage. It is a wooden hut, painted black and white in checkers, with a signal mast.

The town is situated at the mouth of a large ravine, and is surrounded by clusters of date and fig trees. A gap in the hills at the back, and a large white stone barrack, situated well to the southeastward of the town, are conspicuous. The houses are surrounded by gardens.

Trade.—Derna is a place sanctioned for the import and export of goods, through the customs, by the Italian Government. The exports are chiefly wool, corn, wax, and honey, and the imports barley, coffee, flour, maize, manufactured goods, oil, rice, wheat, fruit, sugar, cotton and woolen goods, and tea.

Supplies.—Fresh meat, fruit, and vegetables may be readily obtained; sheep and eggs and fowls are cheap. Derna is the best place between Tripoli and Alexandria for obtaining provisions. Good water can be obtained from an irrigation canal which passes close to the sandy bay about ½ mile eastward of the town.

Communication.—The journey to Benghazi by land would take about 10 days. There is a land telegraph line along the coast to Tripoli and Bou Kemesh.

The coast from Derna trends east-southeastward 25 miles to Ras et Tyn, and is bold cliffs, with high table-land close behind.

Ras et Tyn is lower than the adjacent cliffs to the westward.

The coast from Ras et Tyn trends southward and becomes low for 9 miles, to a low point.

Close to the southward of the ras is a little cove, where small vessels load with salt. Rocks and foul ground extend about 1 mile seaward of Erba Aksur, a small islet, 1¼ miles southward of the ras. A bank, with 9 fathoms water, is reported about 1 mile southeastward of the islet.

This coast forms a sandy bay which affords anchorage nearly midway between the ras and Ship Rock, sheltered from north, through west, to south-southwest.

Jezirat Ehnii lie about 1 mile eastward of the low point just mentioned.

Ship Rock, the northern one, is high, and Umm al Gharami is the southern. Some rocks above water lie close on the western side of Ship Rock, and some sunken rocks in the middle of the channel between it and the shore.

Digitized by Google

Gulf of Bombah.—The coast from the low point inside Jezirat Ehnii trends south-southwestward about 4 miles to Tank Point. A 4-fathom patch lies about 1,400 yards eastward of a point 1½ miles southward of the low point. A rocky shoal projects 2½ miles eastward from the coast for 2 miles northward of Tank Point. Shag Islet lies on the shoal just inside the 5-fathom curve, 1½ miles northeastward of Tank Point, and Zuzra Mezrata (Menelaus) Islet lies on the shoal about 1 mile south-southeastward of Shag Islet. Both islets are very low and difficult to make out when the coast is behind them.

Tank Point.—Two large and very conspicuous factories are situated on Tank Point.

The shore trends westward 1.4 miles from Tank Point to the entrance to a shallow lagoon, and thence it turns gradually southward and eastward, and forms the Gulf of Bombah (ancient Menelaus Harbor), on the north side of which, inside Tank Point, is a good anchorage, but open eastward. No supplies, excepting a little water, are to be obtained here.

Jezirat el Bhurda (Bombah), about 3 miles east-southeastward of Zuzra Mezrata, is a moderately high rock, with foul ground extending ¼ mile off its northwestern end and a 3½-fathom patch ½ mile eastward from its southeastern end. It is a good mark. There is a deep-water channel between the reefs off Zuzra Mezrata and Bhurda.

Seal Island (Emmachae, ancient Platæa), in the southeastern part of the gulf and 8½ miles south-southeastward of El Bhurda, is very low. A kind of tower in the middle of the island may be seen, but none of the other ruins are visible. The island lies off the entrance to Marsa Enharit Khurzita, in which small coasters obtain complete shelter in about 2 fathoms water, but the entrance channel is only about 100 yards wide. In case of urgency a moderate-sized vessel could anchor under the lee of Seal Island in about 4 fathoms water. A rocky shoal which extends nearly 1,200 yards northwestward from the island must be avoided.

Ras allem Ḍauhr (Platæa Point) lies about 1½ miles southeastward of Seal Island, and is connected to it by reefs and shoal water.

The coast from Ras allem Dauhr trends eastward 20 miles to Ras bel Gamma. It is low sand hills, and is fronted with rocks and foul ground, which extend from 1 to 1½ miles off it in places. The coast then trends east-southeastward 15 miles to Ras allem el Milhr, and is higher and bolder.

Ras allem el Milhr.—A rocky reef is charted about 800 yards eastward of the ras, but it is reported to extend considerably farther eastward, and shoaler water than charted has been reported northward of it. A mound, the summit of a hill, 574 feet high, one of

Digitized by Google

the range of hills on the southern side of the entrance to the inlet, bearing 215°, leads southeastward of the shoals.

The coast from the ras trends south-southwestward 1,700 yards to Ras Tebruk, forming an indentation, and is bordered by rocks. A patch of sand between the ras and the point is said to be a good mark on westerly bearings.

Lights.—A group flashing white light is exhibited, at 36 feet above high water, from a lighthouse, a cast-iron column on a masonry base, 25 feet high, about 500 yards westward of Ras allem el Milhr. Visible 12 miles.

A flashing green light is exhibited from a white quadrangular ighthouse, 22 feet high, on Ras Tebruk. Visible 11 miles. (See Light List.)

Signal Station.—There is a signal station westward of Ras allem el Milhr Lighthouse.

Buoy.—A small red conical iron buoy is moored about 500 yards southeastward of Ras Tebruk.

Marsa Tebruk is an inlet extending 2 miles west-northwestward, with a width of about ¾ mile. It affords shelter, except from southeast to east winds, in from 5 to 7 fathoms water, mud and weed bottom. It is said that even with strong east or south winds the anchorage is never very bad. The marsa is a place sanctioned for the import and export of goods, through the customs, by the Italian Government.

On the inner part of the northern shore are some Saracenic ruins, and 1 mile northwestward of them are some ruins, probably of ancient Anti-Pyrgos.

Depths.—There are depths of from 8 to 5 fathoms for 1½ miles within the entrance, whence the water shoals gradually toward the head. The 3-fathom curve is about 300 yards off the north shore for about 1¾ miles within Ras Tebruk, and there are two patches with 3¾ fathoms water about ¼ mile off the north shore, one 1,600 yards, and the other 1.3 miles within the southern extremity of Ras Tebruk.

Shoal.—A small patch with ¾ fathom water lies in the fairway of the inlet nearly 1 mile westward of the southern extremity of Ras Tebruk.

Pier.—A landing pier extends a short distance southward from the vicinity of the Saracenic ruins.

Light.—An occulting red light is exhibited from a square iron framework tower on the pier head. (See Light List.)

Supplies.—No supplies are obtainable. Mullet can be taken by the seine in the small bights in the marsa.

Ahal Rocks, 5½ miles east-southeastward from Ras Tebruk and 2¼ miles from the shore to the southward, are a patch with 3½ fathoms water and steep-to around.

Digitized by Google

The coast from Marsa Tebruk trends east-southeastward with numerous narrow indentations, and rises to high table-land, for 23 miles; it then becomes lower to Ras el Ghain, 14 miles farther eastward. The coast from Ras el Ghain trends east-southeastward 20 miles to Ras al Milhr, and is low white sand hills.

Ras el Ghain is reported to project more than it is shown on the chart. Near and eastward of the ras, and close to the coast, are three black objects, probably wrecks, which appear like rocks.

This long extent of coast is skirted by numerous rocks, which extend about 1 mile off Ras el Ghain and the coast for several miles to the eastward.

Sand banks with breakers have been reported off the coast between Ras el Ghain and Ras al Milhr.

Ras al Milhr (Cape Lukka; ancient *Menelau*) is moderately high and cliffy.

Shoal.—A dangerous shoal extends about 1 mile seaward from the cape where depths of 9 fathoms are shown on the chart.

Caution.—Vessels should not approach within 1½ miles of this cape.

Gulf of Sollum.—The western shore of the Gulf of Sollum from Ras al Milhr trends southward 20 miles, and is moderately high, cliffy and bold.

Port Bardia, 7½ miles southward of Ras al Milhr, is an inlet extending about 1 mile southwestward with a least width of 600 yards, the depths decreasing gradually from 9 fathoms in the entrance to the head, where it forms two bights, in the eastern of which is a reef. It affords shelter to small vessels, except from northeasterly winds. Close southwestward of the inlet is a salt lagoon, in which there are eels and gray mullet, and on the southern side of the lagoon about ½ mile from the beach is a well used by the Arabs, who have an encampment here.

Beacon Point, a small projection, 36 feet high, is about 12 miles southward of Port Bardia. The high and cliffy coast ends here, and it becomes low.

Akaba es Sollum, the anchorage of Sollum, is situated to the southward of Beacon Point, and affords shelter from westerly winds, in 8 fathoms, sand and weed, about 800 yards southward of the southern extremity of Beacon Point. A patch with 3 fathoms water lies just within the 5-fathom curve, 1,400 yards 204° from the southern extremity of Beacon Point.

Sollum is near the boundary between Tripoli and Egypt, and a pilgrim's road to Mecca runs close along the beach.

The coast of Egypt.—The southern shore of the Gulf of Sollum from Sollum Anchorage trends eastward about 42 miles to Ras Haleima (Alem Ghomed). It is low and sandy, with occasional

Digitized by Google

rocky points, and is bordered by rocks in many places. An area from about 10 to 18 miles eastward of Beacon Point has not been examined.

The coast from Ras Haleima trends east-southeastward 53 miles to Ras Bulau. It is low and backed by small sand hills, with rocky reefs and foul ground extending off and along it.

Taifa Rock, about 15 miles eastward of Ras Haleima, and 2¼ miles offshore, is 5 feet high, with sunken rocks around, and deep water close-to.

Ishaila Rocks and Anchorage.—Nearly 20 miles eastward of Taifa Rock, and 1.3 miles offshore, is Jezirat Ishaila, a rock or islet about 58 feet high, and from it reefs extend 2 miles west-south-westward. There is anchorage in case of urgency in 16 fathoms, sand, about 600 yards southward of the islet. Great caution is necessary in navigation, as much of the ground in this locality has not been surveyed.

About 1.3 miles east-southeastward of Jezirat Ishaila is a reef, and reefs in patches continue along the coast for about 10 miles to the eastward.

Caution is necessary in navigation between Ras Haleima and Ras Bulau, the coast being low and the soundings deep close to the reefs. In places the 100-fathom curve is less than 1 mile off them, and ¾ mile northward of the western Ishaila Rock there is a depth of 140 fathoms.

Ras Bulau (ancient Naten) is moderately high and cliffy. A range of hills runs some 7 miles southward from it and attains a height of about 500 feet.

A rocky bay, the shores of which are high, lies between Ras Bulau and Ras Ummrakum (ancient Zephyron Promontory) 5 miles south-eastward.

Marsa Ummrakum, on the eastern side of Ras Ummrakum, affords shelter from northerly and westerly winds, inside a line of rocky reefs extending nearly 2¼ miles eastward from Ras Ummrakum. Ummrakum Reef, the eastern part of the line, is partly above water, and from about 1,400 yards east-southeastward of it reefs continue about 1 mile east-southeastward. The anchorage is about 800 yards southeastward of the highest part of Ummrakum Reef, in from 8 to 10 fathoms, sand, but it would be dangerous to attempt to enter it without a boat or boats ahead sounding. The shores of the marsa are low. About ¾ mile inland on the southern shore, and 4 miles from Ras Ummrakum, is an Arab village built on the site of ancient Delphinon.

The coast from 4½ miles eastward of Ras Ummrakum trends eastward nearly 3 miles to Ras Labeit. It is cliffy and bordered by rocks; the ras is low.

Digitized by Google

Marsa Matruh, eastward of Ras Labeit, is an indentation in the coast 1.6 miles long east and west, and 1,400 yards deep. It is completely sheltered from seaward by a reef and rocks extending 350 yards eastward from Ras Labeit, the western entrance point, and by Matruh Reef, a line of small islets, rocks, and reefs, upon which the sea breaks heavily, extending ½ mile westward from the eastern entrance point. Several of the rocks of Matruh Reef are awash, and on the largest islet is a conspicuous white rock 6 feet high. There are three passes through Matruh Reef available for boats in fine weather.

The western shore of the marsa is flat sand, subject to inundation and change. The southern shore is low sand hills, with some cliffs from 5 to 20 feet high, and a conspicuous cairn 30 feet high in the middle. Eastward of the cairn are coast-guard houses, barracks, and other buildings. The eastern shore is flat sand, subject to inundation.

A conspicuous coast-guard fort, with a flagstaff, stands on the eastern entrance point, about 800 yards from its extremity.

On the southern shore are the ruins of the ancient Parætonium, and both westward and eastward of the marsa is a large salt lagoon.

A shoal extending southward from Matruh Reef occupies the central part of the marsa. It is studded with rocks, on which are from 2 to 3 feet water, with from 6 to 7 feet between. On the eastern side of the shoal is a stone breakwater, which extends 210 yards southwestward, and then turns southward 90 yards. Eastward of the breakwater is a pool, about ¼ mile in extent, with depths of 24 to 47 feet, in which there is anchorage.

Entrance—Beacons.—The entrance between the rocks extending eastward from Ras Labeit and Matruh Reef is 200 yards wide. Pole beacons stand on the outer rocks on each side. The depth in the entrance is from 19 to 30 feet.

Channel.—A channel, partly formed by dredging, with a least width of 100 yards and a least depth of 16 feet, leads, westward and southward of the central shoal, to the pool eastward of the breakwater.

Range beacons.—Pole beacons, surmounted by triangles, stand on the southwestern shore of the marsa, and in range, bearing 230°, lead through the entrance. Similar beacons on the southeastern side in range, bearing 88°, lead through the channel southward of the central shoal.

Buoys.—Seven black conical buoys mark the western and southern sides of the channel, and six conical buoys, painted black and white in horizontal bands, mark the eastern and northern sides of the channel. A mooring buoy lies in 29 feet water 550 yards 95°

Digitized by Google

from the end of the breakwater. The positions of the buoys marking the channel are liable to change.

Directions.—Enter with the range beacons on the southwestern shore of the marsa in range, bearing 230°. When past the pole beacon on the outer end of Matruh Reef, turn southward and pass between No. 1 black buoy and No. 1 black and white horizontally striped buoy; then steer south-southeastward between the buoys until between No. 5 pair, when keep the eastern beacons in range, bearing 88°, until abreast No. 6 striped buoy; then steer about 50° and pass some 40 yards northwestward of No. 7 black buoy, whence proceed direct into the pool eastward of the breakwater.

Small vessels anchor in 27 feet inside the entrance, eastward of the first pair of channel buoys, and 204°, nearly 300 yards from the beacon on the outer end of Matruh Reef.

The depths in the marsa are liable to change during heavy weather.

Tides.—Springs rise 1 foot, neaps ½ foot; water banks up in the marsa during strong northerly and westerly winds.

The coast from the eastern entrance point to Marsa Matruh trends eastward 6 miles to Ras alem Rum, and is rocky and skirted with outlying rocks.

Ras alem Rum (ancient Parætonium Promontory) is the termination of a hilly spur from the apex of two ranges of hills which run westward and southward. The latter range attains a height of about 300 feet.

The coast from Ras alem Rum trends southward 8 miles, and then eastward 27 miles to Ras el Kanais. It is deeply indented by small sandy bays. A range of hills and table-land extends, 2 to 3 miles inland, eastward from some 11 miles southward of Ras alem Rum nearly to Ras el Kanais. The western part is about 600 feet high.

Medina Reefs extend south-southeastward along and distant 2 to 3 miles from the coast between 2 and 8 miles southward of Ras alem Rum.

Ras Bakshuba (ancient Ladamantan Promontory), 18 miles southeastward from Ras alem Rum, is a bluff white headland. Shoal water extends 800 yards northward of the ras, and a rocky reef about 600 yards northeastward. Jezirat Bakshuba, 800 yards south-southeastward of the ras, is about 500 yards long east and west, and surrounded by rocks. A spit with from 1 to 2¾ fathoms water extends ½ mile east-southeastward from the island.

Marsa Bakshuba, southward of the island, affords shelter from northwesterly and westerly winds, but the holding ground is not good. The anchorage is about ½ mile southward of the eastern end of the island in 5 fathoms, sand. A little to the northward of this position the bottom is rocky.

Digitized by Google

Supplies.—Sheep, etc., may be obtained from the Arabs in this vicinity, but only at extravagant prices.

Marsa Dakalla (ancient Zygren), about 2½ miles eastward of Marsa Bakshuba, is a small boat harbor, with depths of from 1 to 3 fathoms, lying inside a line of rocks, which extends between two jutting out points. There are three narrow entrances into the marsa, the eastern of which has 3 fathoms water.

Bluff Point, the eastern point, is a large black rock, which shows clearly against the sand hills behind.

Ras el Kanais (ancient Leuce Acte).—There is a remarkable gap in the land a short distance inside the ras, which appears as an island from a distance of about 10 miles on some bearings. From nearer the ras the black rocks skirted it show against the white sand hills.

Gulf of Kanais.—The coast from Ras el Kanais trends southward 8½ miles, and then turns eastward 29 miles to Ras et Dhabba (ancient Zephirium). El Homfis, high rocks, surrounded by a reef, lie 6¾ miles southward of Ras el Kanais and 1 mile offshore. There are depths of 4 and 6 fathoms inside the reef. El Egaili (ancient Pidonia) Islet, 7¼ miles farther eastward, is on the middle of Gregrien Reef, which connects it to the shore and projects 1 mile to the eastward. The eastern end of the reef is nearly 1 mile offshore, with 3 and 5 fathoms water between.

Abu Jerab (ancient Trakhea) is the coast which extends 4 miles eastward from 3¼ miles eastward of Gregrien Reef. It is a line of remarkable black cliffs, with hills close inland 100 feet high.

Sambra Reef (ancient Myrmiki), 4 miles eastward of Abu Jerab, is 1 mile long east and west and the same distance offshore. Abu Sambra Cliff is about 1½ miles long. Its western end lies about 1 mile southeastward of the eastern end of the reef.

Arab's Gulf is the great indentation in the coast between Ras et Dhabba and Alexandria, 73 miles to the eastward. The gulf extends 18 miles to the southward.

The coast from Ras et Dhabba trends east-southeastward 20 miles to Ras el Gabisa (Gahbess) and is skirted by reefs.

Reef.—A rocky reef extends nearly 1 mile eastward from a small jutting out point about 1½ miles southeastward of Ras et Dhabba.

Tanub Reef projects eastward and southeastward nearly 2 miles from a point 6 miles southeastward of Ras et Dhabba. It is nearly awash, and the outer edge is about 1 mile offshore. There is a depth of 4 fathoms ¾ mile eastward of the reef, and the 100-fathom curve is 1½ miles northeastward of the reef.

Reefs extend nearly 1 mile and ½ mile, respectively, off two points situated about 13 and 16 miles east-southeastward of Ras et Dhabba.

Patch.—A 3½-fathom patch lies 2½ miles northwestward of Ras el Gabisa. There are from 6 to 14 fathoms water close northward of it.

Digitized by Google

Gahbess Reef, 1¼ miles northward of Ras el Gabisa, is awash, and shoal water extends 600 yards northward from it.

The coast from Ras el Gabisa turns southward and eastward to El Amaid, and is skirted by shoals.

Anchorage.—There is shelter from westerly winds in from 4 to 5 fathoms water, with Ras el Gabisa bearing about 299° distant 1¼ miles.

Shkeik Reef.—Ras Shkeik lies nearly 5 miles south-southeastward of Ras el Gabisa, and Shkeik Reef extends nearly 3 miles northeastward and 2 miles eastward from it.

Shimahme Banks.—Junil Meleha is a hill rising close within a point situated 7 miles east-southeastward of Ras Shkeik, and the Shimahme Banks, with about 1 fathom water, extend 2½ miles northeastward of the point, and from about 4 miles to 1½ miles off the coast eastward to El Amaid, a distance of nearly 9 miles.

El Amaid (Almaida), 20½ miles east-southeastward of Ras el Gabisa, is a conspicuous ruined square two-storied tower, standing on the low hills ½ mile from the beach. About 5 miles southward of the tower is a range of hills, of which Umm Melhaish, the highest, is 475 feet high. An old pilgrim route leads from El Amaid to the River Nile, some 25 miles below Cairo.

Light.—A fixed white light is exhibited, at 187 feet above high water, from a white iron tripod lighthouse, situated about ½ mile northwestward of El Amaid and 150 yards inshore. Visible 22 miles.

The sand from the desert makes the columns of the lighthouse appear gray. (See Light List.)

Anchorage.—There is good anchorage nearly 2½ miles northward of the lighthouse, in 6 fathoms water, during offshore winds. Good water can be obtained near the tower.

The coast from El Amaid trends east-northeastward 36 miles to Fort Ajemi, on the western point of Alexandria Harbor, and is a sand beach, with low hills close inland, fronted for nearly the whole extent by numerous reefs and foul ground.

Medina Reef, the westernmost of these shoals, the western end of which is situated 7 miles 27° from El Amaid Lighthouse, is 1½ miles long east and west and nearly 1 mile broad, with its southern part awash, and 2 to 3 fathoms on the remainder. The reef is 5 miles offshore, and there are three patches with 3 fathoms water situated, respectively, 1 mile 174°, 2 miles 115°, and 1¾ miles 61°, from its shoalest part.

A patch ¾ mile long east-northeast and west-southwest, and nearly awash, lies about 7 miles east-northeastward from the shoalest part of Medina Reef.

Abusir Hill, 22 miles eastward of El Amaid and 1 mile inland, is the highest land in this locality, and there are the ruins of a castle on it.

Digitized by Google

Arab's Tower (Arab-guelli), a short distance eastward of Abusir Castle, is situated on a hill 250 feet high.

Abusir Reef extends about 6 miles east-northeastward from about 7 miles westward of Arab's Tower, and is narrow and rocky, with average depths of 4 to 5 fathoms. A patch nearly awash lies 1½ miles from its western end, and Victorieuse Rock, with 1½ fathoms water, is said to lie on the reef, with Arab's Tower bearing 117°, distant 4 miles, but this position is doubtful.

Reefs.—Several reefs lie within 1¾ miles off the coast between Arab's Tower and Fort Ajemi, and some islets and rocks lie within 1,400 yards southwestward of the fort.

Directions—Arab's Gulf.—Between Ras et Dhabba and Ras el Gabisa do not shoal the water to less than 25 fathoms, observing that caution is necessary in the vicinity of Tanub Reef, which is approached closely by deep water. From Ras el Gabisa do not shoal to less than 10 fathoms until near Medina Reef, whence keep in not less than 20 fathoms to Alexandria.

At night El Amaid Light bearing 122° leads northeastward of the shoals off and southeastward of Ras el Gabisa until about 2½ miles from the light. El Amaid Light bearing 188° leads 1½ miles westward of the 5-fathom extremity of Medina Reef.

Caution.—There is said to be a strong indraft into Arab's Gulf at times, so the lead should be constantly used.

Alexandria Harbor is situated in the northeastern portion of a bay which extends about 5¾ miles northeastward from Fort Ajemi (El Ayana). Marabut (Agemi) Islet, about 400 yards in length northeast and southwest and covered with an old fort, and El Agrash, a smaller islet, surrounded by rocks, extend about 800 yards northeastward of Fort Ajemi; thence a line of reefs trends across the entrance to the bay directly toward Eunostos Point, a distance of 4¼ miles. There are four channels through the reefs, named Marabut, the Great, Straight Boghaz, and Corvette Passes, respectively, from the westward. Inside the reefs and off the southeastern shore of the bay there are depths of from 5 to 10 fathoms over a width of from 1,500 to 700 yards.

The harbor is sheltered by the Outer and Quarantine Breakwaters, which extend from Eunostos Point (locally Ras el Tin) and the Quarantine Abattoir ground, respectively, with an entrance 430 yards wide between them. It is divided into two portions by the Coal Mole, the southwestern part being named the Outer Harbor and the northeastern part the Inner Harbor. The area of the water surface of the harbor is 1,863 acres.

The administrative limits of the port of Alexandria are within a line drawn from Fort Ajemi to about 400 yards outside Straight Boghaz Pass, and thence to Eunostos Point.

Digitized by Google

Approach.—The city is situated on and within a peninsula projecting about 1 mile north-northwestward from the coast, the outer end of which bifurcates into narrow arms stretching southwestward and northeastward. On the southwestern arm are barracks, Ras el Tin Palace and Harem, a military hospital, and near the extremity a high lighthouse; on the extremity of the northeastern arm is the square castle of Pharos (Fort Kaid Bai (Pharos)), with a tower supposed to be built on the site of the famous ancient Pharos.

From the northwestward and northward Ras el Tin Lighthouse on Eunostos Point is usually first sighted; then the palace and harem become visible; to the southwestward Kamaria Signal Station and abattoir, Mex Lighthouses, and Fort Sheffakhana are conspicuous, but Marabut Islet, with its fort, is low, and not generally seen from a distance of more than 8 miles.

Vessels are sometimes set to the eastward, and the Bourg Fort, Abukir, 10½ miles northeastward of Pharos Castle, has been mistaken for Fort Marabut, to which it is similar in appearance, but Nelson Island, 2½ miles northeastward of the Bourg, shows like a round-backed hill, and the land westward of the Bourg is moderately high and has some houses and trees on it, whereas westward of Fort Marabut the land is low and sandy, with no houses or trees.

The soundings decrease gradually toward the land, which should not be approached to a depth less than 20 fathoms, except to enter one of the passes.

The northern angle of Fort Ada in range with Pharos Tower, bearing 71° leads from about 2 miles to 600 yards outside the reefs between Marabut Islet and Eunostos Point. Vessels waiting for a pilot should not go southward of this line until the beacons at the entrances to Great and Straight Boghaz Passes are seen.

Lights—Ras el Tin.—A revolving white light is exhibited, at 180 feet above high water, from a circular stone tower with a white lantern, near the extremity of Eunostos Point.

Great Pass—Range lights—Rear.—Two fixed white lights are exhibited from a circular tower, the lower part of which is white and the upper part black, surmounted by a ball and spike, situated about 800 yards inland south-southeastward of the breakwater lighthouse. This lighthouse is known as Mex High Lighthouse. The lights are visible 10 miles.

Front.—Three vertical lights, red, white, red, white in center, are exhibited from a circular tower, 64 feet high, and painted red and white in horizontal bands, situated 800 yards 293° from the preceding light.

Great Pass—Entrance.—An occulting white light is exhibited, at 65 feet above high water, from a red concrete lightbeacon, situated in 25 feet water on the southern side of the entrance to Great Pass.

Digitized by Google

North Shoal.—A fixed white light is exhibited, at 47 feet above high water, from a black iron framework tower, situated in 29 feet water, on the southern end of North Shoal, on the northern side of the pass.

Outer breakwater.—An occulting red light is exhibited, at 53 feet above high water, from a white circular tower on a red masonry pedestal, situated on the southwestern extremity of the Outer Breakwater.

Timber Quays Breakwater.—A fixed green light is exhibited from the angle near the middle of the breakwater. (See Light List.)

Coal Mole, Gabari.—A fixed green light is exhibited from a gray hexagonal tower on a red masonry pedestal, on the northern extremity of the Coal Mole.

Inner Harbor.—Red and green lights are exhibited from the Coast Guard Pier on the northwestern shore of the Inner Harbor.

A fixed red light is exhibited from the end of the western mole, and a fixed green light from the end of the eastern mole, at the entrance to Arsenal Basin.

Buoys—Great Pass.—A red conical buoy marks the 1-fathom shoal northward of Hydrographer Shoal.

Great Pass Pivot Lightbuoy.—A black spherical lightbuoy, exhibiting a fixed white light, is moored on the northern side of the inner end of Great Pass, about ½ mile east-southeastward of North Shoal Lightbeacon. (See Light List.)

El Fara Shoal.—A red conical buoy marks the northeastern extremity of El Fara Shoal, and lies 50 yards southwestward of Straight Boghaz Pass.

Outer Breakwater.—A black barrel buoy is moored about 25 yards off the southern end of the Outer Breakwater, and marks the limit of shoal water.

Quarantine Breakwater.—A red conical buoy, exhibiting a fixed green light, is moored about 50 yards northwestward of the northwestern end of Quarantine Breakwater.

Timber Quays Breakwater.—A black can buoy marks the position of the intended future southern extremity of the breakwater. A green conical buoy, exhibiting a fixed green light, marks the position of the intended northeastern extremity of the breakwater.

Harbor Bank.—A black can buoy is moored on the southeastern side of Harbor Bank, about 1,750 yards southwestward of the Coal Mole Lighthouse.

A black lightbuoy, exhibiting a fixed red light, is moored on the southeastern side of Harbor Bank, about 600 yards southwestward of the Coal Mole Lighthouse.

Digitized by Google

A black can buoy, surmounted by a cage, is moored near the eastern end of Harbor Bank, about 400 yards westward of the Coal Mole Lighthouse.

The last two buoys are liable to be shifted while dredging operations are being carried out. Vessels leave these buoys to the northwestward.

A small red can buoy is moored on the western end of a rocky reef about 160 yards southward of the inner end of the Outer Breakwater.

Coal Mole.—A black barrel-shaped buoy is moored about 25 yards southward of the western arm of the Coal Mole, and marks the limit of shoal water.

Inner Harbor.—A black can buoy is moored on the western side of the approach to the entrance of Arsenal Basin.

Outer Anchorage.—The anchorage outside the reefs is not recommended; the sea becomes heavy even with light winds from seaward, and then communication by boats is dangerous. Large vessels anchoring temporarily outside the reefs should avoid the vicinity of a patch with 32 feet water about 1,700 yards westward of Ras el Tin Lighthouse.

Marabut Pass, 600 yards wide, situated between Marabut Fort and Great Pass, is used only by coasting craft. A red iron pole beacon stands on a rock on the northern part of Marabut Reef, 900 yards northeastward from Marabut Fort; the sea generally breaks on the rock. A stone beacon in the form of a dome stands on shore, about ½ mile southward of Marsa el Kanat, and about 200 yards north-northwestward of it is the white horn mark, a long white wall with knobs at each end.

West Beacon, a pole surmounted by a red triangle, about 800 yards westward of the stone beacon, is an old mark.

Directions.—Approach and enter the pass with the stone dome beacon one-fourth the distance from the eastern toward the western knob of the white horn mark, 152°, which leads through the pass in not less than 23 feet water. When the lighthouse on the southern end of the breakwater bears 54°, steer to pass about 100 yards southward of it, and thence as directed on page 492.

Great Pass, about 1½ miles northeastward of Marabut Fort, is the principal pass leading through the reefs, and the only one available at night; it is 200 yards wide, with a least depth of 35 feet, sandstone bottom.

Beacons.—The axis of the pass is marked by the alignment of Great Pass Range Lighthouses, or their lights at night, bearing 113°.

The southwestern limit of the pass is marked by the alignment of the South Front Beacon, a short mast surmounted by a lattice-work triangle, situated about 150 yards west-southwestward of Great

Digitized by Google

Pass Front Range Lighthouse, with the South Back Beacon, a tall mast carrying a lattice-work oblong, situated about 150 yards south-southeastward of Great Pass Rear Range Lighthouse.

The northeastern limit of the pass is marked by the alignment of the North Front Beacon, a short mast surmounted by a lattice-work triangle, situated about 100 yards northeastward of Great Pass Front Range Lighthouse, with the North Back Beacon, a tall mast carrying a lattice-work oval, situated 150 yards north-northwestward of Great Pass Rear Range Lighthouse.

Both pairs of beacons in range bear 113°.

Great Pass Entrance Lightbeacon and North Shoal Lightbeacon, see page 489.

Shoals.—A shoal, with 3 fathoms water, is situated on the northern edge of Great Pass, with Great Pass Entrance Lightbeacon bearing 253°, distant nearly 400 yards. A shoal, with 1 fathom water, lies at the northern extremity of Hydrographer Shoal and near the southern edge of Great Pass, with North Shoal Lightbeacon bearing 80°, distant about 550 yards.

Caution.—Less water than is shown on the charts may exist over the shoals on either side of Great Pass.

Directions.—Approach and enter Great Pass with the range lighthouses or lights in range, 113°; keep the marks in range as exactly as possible in the pass, the limits of which are shown by the beacons above mentioned in daylight. Great Pass Lightbeacon and the red buoy northward of Hydrographer Shoal are left to the southward, and North Shoal Red Lightbeacon to the northward. On arriving southward of the pivot lightbuoy steer toward the entrance to the harbor.

Vessels about to enter, arriving at the entrance to the Outer Harbor, should blow the steam whistle to warn vessels inside and about to leave, which should wait until the entering vessel is within the Coal Mole.

In entering, pass southward of the black buoy off the end of the Outer Breakwater and northward of the red lightbuoy off the end of Quarantine Breakwater; the three black buoys, one of which is a lightbuoy, marking Harbor Bank are left on the port hand.

Vessels should not enter the Inner Harbor before a berth has been assigned to them.

Straight Boghaz Pass, nearly 2½ miles northeastward of Marabut Islet, is 100 yards wide, with a least depth of 28 feet; it is not available at night, and is impracticable when the sea is heavy. It is necessary to be cautious in entering in a vessel of deep draft when there is a swell, for sand may be deposited in the pass, which will reduce the depth until it is removed. The depth is affected by the prevailing wind to the extent of 3 feet; with smooth water in summer the

Digitized by Google

depth is more than the normal, but in winter, when the sea is generally somewhat heavy, the depth is less.

Beacons.—The axis of the pass is marked by the alignment of Mex High Lighthouse (Great Pass Rear Lighthouse) with Mex Low Lighthouse, a black circular stone tower on a rock 170 yards offshore, the light from which is not now exhibited, 134°.

The southwestern limit of the pass is marked by the alignment of Boghaz Western Front Beacon, a mast carrying a semicircle arc downward, situated on the shore south-southeastward of Mex Front Lighthouse, with South Back Beacon.

The northeastern limit of the pass is marked by the alignment of Boghaz Eastern Front Beacon, a mast carrying a semicircle arc downward, situated on the shore southeastward of Mex Front Lighthouse with North Back Beacon.

NOTE.—Mex High Lighthouse is the rear range mark for both Great and Straight Boghaz Passes; and South and North Back Beacons are also used as limiting beacons for both passes.

Boghaz Entrance Beacon, a black pole surmounted by two cylinders, 50 feet high, is situated on a shoal, with 17 feet water, near the entrance to the pass and 100 yards northeastward of the fairway.

El Kot Beacon, a black pole surmounted by a ball, 33 feet high, is situated on a shoal with 1½ fathoms water, about 700 yards within the entrance beacon and nearly 200 yards northeastward of the pass.

El Fara Beacon, a pole surmounted by a triangle, 36 feet high, is situated on a shoal with 4 feet water, 700 yards southwestward from El Kot Beacon.

Directions.—Enter the pass with Mex High Lighthouse in range with Mex Low (old) Lighthouse, bearing 134°. The marks should be brought in range while well seaward of the entrance beacon, which is on the northeastern side of the pass. El Kot Beacon is also on the northeastern and El Fara Beacon and buoy on the southwestern side of the pass. The side limits of the pass are shown by the beacons above mentioned. When the Breakwater Lighthouse bears about 90° turn eastward and into the harbor, as before directed.

Great and Straight Boghaz Passes—Regulations.—Only one steamer is permitted to use the same pass at a time.

Steamers leaving the port are to give way to those arriving.

Vessels not intending to enter the harbor should not approach the passes except in unavoidable circumstances.

Before entering a pass from seaward, steamers must, between sunrise and sunset, hoist International Code Signal R. S. M. (wait), and sound their whistles. After sunset a blue light should be burnt by all steamers approaching a pass whether bound inward or outward.

If an outgoing steamer is in a pass at the time an incoming one arrives at the sea end, the outgoing steamer will hoist Y. S. M. by day,

Digitized by Google

or burn a blue light at night, and sound her whistle; the arriving steamer should then wait outside until the pass is clear.

By day.—Outgoing steamers must not approach Great Pass Pivot Buoy (if using Great Pass) or El Kot (if using Straight Boghaz Pass) within ½ mile, in the event of a steamer entering the pass they require to use from seaward, until the arriving vessel is inside and clear of the pass. Vessels must not lie with the range marks in line so as to obscure them from a vessel entering.

Should both passes be signaled as in use, the outgoing steamer must stop off Kamaria Signal Station until the signal station indicates that all is clear.

When two vessels are proceeding out of the same pass, the second vessel must not bring the range marks in line, so as to obscure them from the leading vessel, until the first is outside and clear.

At night.—Only Great Pass is in use at night, and an outgoing steamer must stop off Kamaria Signal Station when a signal shows that the pass is being used by an incoming steamer until the signal station indicates that the pass is clear.

Sailing vessels crossing the paths of steamers in the passes do so at their own risk.

Sailing vessels must not anchor in the entrance between the Outer and Quarantine Breakwaters.

Pass signals.—The following signals are made from Kamaria Signal Station, a white circular tower and a flagstaff on the small Kamaria Hill, situated 700 yards northeastward of the Quarantine Port, Alexandria Outer Harbor:

By day.	At night.	Signification.
One ball at southwest yardarm.....	Two white lights, horizontal.....	Great Pass clear.
One diamond at northeast yardarm.....	No signal made.....	Boghaz Pass clear.
Three balls at southwest yardarm.....	Two red lights, horizontal.....	Vessel in Great Pass.
Two diamonds at northeast yardarm.....	No signal made.....	Vessel in Boghaz Pass.

Pilots.—In moderate weather pilots are always outside the reefs, but in strong winds, with much sea on, they remain inside the harbor entrance.

In heavy weather, when the pilot boats can not go out, a black flag with two yellow crosses is hoisted at the signal station and also at Ras el Tin Lighthouse. If pilots are unable, on account of the sea, to board vessels, International Code Flag V is hoisted on board the pilot tug, and this signal is independent of any signals made from Fort Napoleon (Kom el Nadoura) Signal Station; commanding officers must then pilot their vessels through the pass or remain outside until the weather moderates. The pilot's services commence, or end, abreast the Outer Breakwater Lighthouse.

Digitized by Google

When a naval vessel has obtained permission to enter the Inner Harbor, a representative of the port authority will indicate the buoy to be picked up.

Pilotage dues are compulsory for merchant vessels whether a pilot is employed or not.

The dues are increased 50 per cent if an ingoing vessel passes either of the outer beacons, or an outgoing vessel passes the end of the Outer Breakwater, after sunset.

Naval vessels, if they employ a pilot, pay on entering and leaving the port.

Vessels leaving which require a pilot should apply to the director general of ports and lighthouses, and hoist the pilot flag at the mizzen.

Harbor pilots and mooring boats will be supplied on application to the harbor master.

Dredging operations.—While dredging operations are in progress in a pass—

The dredger hoists a square red flag while working, and when this flag is dipped it indicates that the pass is clear.

Outgoing vessels, during dredging operations, must not proceed from the breakwater, where they should sound their whistles, to the entrance of the pass until the dredger has signaled that the pass is clear.

Ingoing vessels must, on nearing the pass, sound their whistles, and remain outside the pass until the dredger has signaled that the pass is clear.

Vessels must pass the dredger at slow speed. A black ball at the yardarm denotes the side on which the vessel is to pass.

The dredger, when at work at night, carries three electric lights, one at the bow, one at the stern, and one on the bridge, and when not working at night, two white lights at the masthead. When the dredger is working at night leaving the pass free, she will carry a white light at the masthead and two white lights above the bulwarks on the side a vessel is to pass.

Corvette Pass, 1,800 yards northeastward of Straight Boghaz Pass, is about 100 yards wide between the 3-fathom curve of the reefs, and has a least depth of 21 feet; it is available for small vessels by day only.

Beacons.—El Hut Rocks, on the western side of the pass, are marked by a pole beacon, 21 feet high, on their southern part. Ikvan Rock, on the eastern side, is marked by a red pole beacon, surmounted by a ball, 23 feet high, on its southern extremity.

Range beacons.—Two black pole beacons, 76 feet high, stand on the shore southward of Mex Harbor; the rear beacon is sur-

Digitized by Google

mounted by two balls, placed vertically, 6 feet apart; the front beacon is surmounted by two diamonds, placed vertically, 9 feet apart, and is distant 600 yards from the rear beacon. The beacons in range, 182°, lead through Corvette Pass in not less than 21 feet water; from seaward they appear in a clear space between some houses to the eastward and an old mill to the westward.

Near the front beacon is a conspicuous mosque.

This pass should not be taken by a stranger.

Hole in the Wall, a boat passage about 33 feet wide, lies between Eunostos Point and the northeastern end of the Outer Breakwater, but it should not be used except by those possessing local knowledge of the channel, and it is impracticable in heavy weather.

The following directions are given: Approach with Sidi Gabari Mosque in range with the middle of the flat part of the breakwater (500 yards from the northeastern end) 130° until a beacon 330 yards from the northeastern end of the breakwater is in range with Fort Napoleon flagstaff bearing 85°, when steer for the pass; round the end of the breakwater closely, and steer to leave a small red can buoy about 160 yards to the southward of it, and which marks the western end of a rocky reef, on the port hand.

When leaving, after passing the end of the breakwater keep close to its outer side, with the northeastern end of the breakwater in range with the southern end of the Military Hospital buildings, 65° until abreast the flat part of the breakwater; then keep the beacon, 330 yards from the northeastern end of the breakwater, in range with Fort Napoleon flagstaff, 85°, until the Breakwater Lighthouse opens westward of the line of the breakwater, about 186°.

When the water is smooth, the beacon, 330 yards from the northeastern end of the breakwater, in range with Sidi Gabari Mosque, leads between the shoal off Eunostos Point and the 1½-fathom patch to the southwestward.

The Outer Harbor, with an area of 1,398 acres, extends about 1¾ miles northeastward from its entrance, which is situated between the Outer and Quarantine Breakwaters, and the space southeastward of Harbor Bank, about 1,200 yards broad, has depths of from 65 to 31 feet, mud and sand bottom. It includes the Coal Basin, petroleum quays, quays for vessels of small draft, and small shelter ports along the southeastern shore for discharge of bricks, lime, cement, and inflammable materials; also timber quays and the Quarantine Port, a special port for cattle.

The Outer Breakwater, built of blocks of concrete with rubble masonry inside, was commenced in 1871 and finished in 1910. Its northeastern end is separated from an islet near Eunostos Point by the Hole in the Wall, a boat passage 33 feet wide. It extends

Digitized by Google

1,200 yards 230° and then 1.3 miles 189°. The top of the breakwater is about 10 feet above the lowest level of the sea. About 500 yards from the northeastern end several concrete blocks are laid horizontally and show well owing to the greater number of the blocks being placed irregularly.

Beacon.—An iron pole, surmounted by a ball, stands on the breakwater, 330 yards from its northeastern end.

Harbor Bank, with several patches of from 7 to 10 feet water, and on the northwestern portion of which the breakwater is built, occupies the northwestern portion of the Outer Harbor.

Dredging.—A part of Harbor Bank has been dredged to a depth of 33 feet, but it has not been examined since, nor is it at present open to navigation; less water has been reported. The southeastern part of the bank is to be dredged to a depth of 33 feet. A depth of 31 feet only can be relied on northwestward of the Coal Mole.

Quarantine Breakwater extends 450 yards 328° from the Quarantine Mole, which is about 200 yards in length, and forms the Quarantine Port, between it and the shore to the northeastward; it is situated east-southeastward of the southern end of the Outer Breakwater. A gray tower, 41 feet high, stands on the northern end of Quarantine Breakwater.

Buheireh Beacon, a pole surmounted by a black ball, near the inner end of the mole, is an old mark.

Timber Quays Breakwater extends from about 400 yards eastward of the northern end of Quarantine Breakwater, 350 yards 21°, and then 440 yards 49°; it is not yet completed.

Coal Mole.—The Coal Mole at the northeastern end of the Outer Harbor extends about ½ mile northwestward from the Gabari (Gabbari) coast; from its outer end an arm turns southwestward and south-southeastward about 800 yards, forming the Coal Basin, which has depths of from 38 to 48 feet.

Inner Breakwater.—A breakwater extends 140 yards southward from a point situated about 200 yards southward of Ras el Tin Lighthouse, and from 50 yards eastward of its southern end a curved detached breakwater extends 400 yards southeastward. There are two pole beacons, each surmounted by a ball, at the southwestern angle of the detached breakwater; the outer one is black and the inner one white; and at the eastern end is a hut with a flagstaff.

Quays and berths.—Coal Basin Quays.—There are seven berths in the Coal Basin (55 to 61), numbered from the end of the curved arm. Nos. 55 and 56, on the southwestern side of the basin, have a total length of 860 feet; Nos. 57, 58, 59, in the curve, have lengths of 430, 440, and 425 feet, respectively; and Nos. 60 and 61, on the northeastern side of the basin, have a total length of 725 feet. All

Digitized by Google

the seven berths have a depth of 28 feet alongside; there are no pontoons. The quay surface has a minimum width of 181 feet.

Petroleum Quay lies southward of Coal Basin, and has a depth of 9 feet alongside. There are three piers for the discharge of petroleum and tanks for its reception; Jetee Mantcheff, the largest of the piers, is of stone, the others of iron; the berths between Coal Mole and the southwest end of Petroleum Quay are numbered 64 to 69.

Next the Petroleum Quay is a space for repairing and building lighters and small craft, beyond which is Gabari Dry Dock, the entrance to which is protected on the west side by a breakwater extending about 130 yards northward.

Southwestward of the dock is a quarantine inclosure for horses under observation; a jetty at the southwestern end forms berth 70, a shelter for loading lighters. Beyond this a stone embankment extends about 500 yards to the Timber Quays.

The Timber Quays are three moles about 394 feet long and 262 feet broad, with spaces 180 feet wide between them and a depth of 27 feet alongside; there are 11 berths (71 to 81).

Kamaria Port, on the southwestern side of the Timber Quays, has two timber slips, Nos. 83, 84, and is used for landing wood from the sailing vessels in the harbor; berth 82, on the east side, has from 8 to 20 feet alongside; at 83, 84 the depth is about 16 feet.

The Nitrate Quay and sheds, about 300 yards southwestward of Kamaria Port, are used for landing and storing nitrates.

Quarantine Port, berth 85, with a depth of 24 feet alongside a jetty 656 feet long and 65 feet broad, fitted with a railroad, is situated at the southern end of the Outer Harbor. Opposite the port are the Quarantine Abattoir and inclosures for cattle.

Inner Harbor.—The Inner Harbor extends about ¾ mile northeastward from the Coal Mole and a line from it to the shore through the Inner Breakwaters; it has an area of 465 acres, with depths of from 25 to 39 feet, but a bank with from about 6 to 18 feet water extends 700 yards from the northern shore.

The harbor includes the Arsenal and Careening Basins, the area of which is 46 acres, situated in its northeastern part. The entrance to these basins is 87 yards wide, and has been dredged to a depth of 27 feet; the central part of the Arsenal Basin has a depth of 27 feet; in the remainder the depths are generally from 9 to 25 feet, with less water in places. On the northern quay of the basin are the magazines and workshops of the coast guard administration, the establishments of the ports and lighthouses administration, the repair workshops, three slipways for tugs, lighters, etc.; also the workshops of the Khedivial Mail Steamship Co. Opposite the central office of the port administration is the Government landing place of Alexandria Harbor, reserved exclusively for the use of Government

Digitized by Google

craft. A jetty, 109 yards long and 10 yards broad, with a depth of 16 feet alongside, at right angles to the quay, is reserved for berthing the tugs and other floating plant of the port administration.

The Careening Basin, eastward of the Arsenal Basin, has depths of from 9 to 25 feet, and can only be used by small vessels.

The speed of launches in Arsenal and Careening Basins must not exceed 4 knots, in order to prevent damage to vessels lying there.

Mooring buoys.—The Inner Harbor is occupied by numerous mooring buoys, laid down in sets, where vessels moor head and stern, head northwestward; the buoys are numbered.

No. 1 buoy for the Khedivial yacht lies 400 yards northwestward from Coal Mole Lighthouse, and buoys Nos. 3 and 4, for naval vessels, northeastward of it, are 620 feet apart and in 29 feet water; large vessels secure between them.

The moorings are rather light for large vessels, and must not be depended on entirely; in winter let go the port anchor about 30 fathoms westward of the headmost buoy, veer to the buoy, and shackle the starboard chain to it.

Harbor works.—Nouveau Quai, in the northeastern part of the harbor, is under construction.

Quai du Mahmudiyeh is being extended northwestward; the extension is marked by green buoys, which are moved as the work progresses.

Quays and berths.—The quays of the Khedivial Mail Steamship Co., in the southwestern part of the Arsenal Basin, have three berths, Nos. 1, 2, and 3.

In the Careening Basin, No. 4 berth, at the northwestern end, is 295 feet long, with a goods shed on the quay. No. 5, the Quai de l'ancienne Douane, on the eastern side, is 1,181 feet long, and used principally for discharging fruit and wine; here is the usual landing place, inside which is the office of the port police. No. 6, the south quay, is 295 feet long; it is used by passengers landing in boats, and there is a disinfecting station, quarantine office, and passport office. No. 7, on the southwestern side, is 443 feet long, and is used for discharging lighters with merchandise from vessels moored outside. The Quai de l'Arsenal has a projection northeastward and another northwestward; the northeastern has three berths, Nos. 8, 9, and 10, 285, 222, and 426 feet long, with depths of 17, 19, and 24 feet alongside, respectively; the northwestern projection has also three berths, Nos. 11, 12, and 13, with lengths of 426, 327, and 469 feet, and depths of 25, 28, and 28 feet alongside, respectively.

Nouveau Quai extends southwestward from Quai de l'Arsenal into the Inner Harbor, and No. 14 berth, on its northwestern side, is 574 feet long; No. 15 berth, on its southwestern side, is under construction. The southeastern side of the quay has two berths, Nos.

Digitized by Google

20 and 21, with a total length of 787 feet and a depth of 28 feet alongside outside floating pontoon. No. 22, the next berth to the northeastward, is 492 feet long, with 16½ feet water alongside. Vessels lie stern on to the quay.

Quai Centrale is divided into two parts by Rue Bab el Karasts, which gives free access to and from the town. The northern part has three berths, Nos. 23, 24, and 25, with a total length of 1,116 feet and a depth alongside of 26 feet outside the floating pontoons; No. 23 is occupied by the Italian Navigation Co., Nos. 24 and 25 by the Austrian Lloyd Co.

The customhouse is abreast No. 25 quay.

The southern part of Quai Centrale has three berths, with a total length of 1,446 feet and depths alongside of from 24½ to 26 feet; No. 26 berth is occupied by the Cie. des Messageries Maritimes, No. 27 by the Ellerman Line, and No. 28 by the Leyland Steamship Co. Behind the line of sheds on Quai Centrale is a railroad.

Quai Moss has three berths; No. 29, on the northern side, is 328 feet long, with 23 feet alongside; No. 30, at the end, is 138 feet long, with 23 feet alongside, but not available for steamers; and No. 31, on the southern side, 344 feet long, with 24 feet alongside. Quai Moss has no floating pontoons.

No. 32 berth, between Quai Moss and the entrance to the Mahmudiyeh Canal, is 696 feet long, but can only be used by small craft; two wooden jetties, each 100 feet long, extend at right angles to the quay.

Quai du Mahmudiyeh, on the west side of the canal mouth, extends northward, and is being extended 500 yards northwestward. No. 33 berth, on the eastern side, can not be used by steamers, but is reserved for the Nile boats using the canal; Nos 34 to 41 berths, around the extension of the quay now in progress, will have a depth of 33 feet alongside; Nos 42 and 43 berths, on the western side of the inner part of the mole, have a total length of 925 feet and depths of from 23 to 26 feet alongside. Railroad lines are laid on the quay.

Old Coal Quay has two berths, No. 44 extending 492 feet southwestward from the inner end of the Quai du Mahmudiyeh, with a depth of 23 feet alongside, and No. 45 extending thence northwestward 577 feet, with a depth of 26 feet outside floating pontoons.

Old Coal Mole, projecting northward from the inner part of the Coal Mole, has two berths, Nos 46 and 47, on the eastern side, with a total length of 921 feet, used for general commerce; No. 48 berth, across the end, is 204 feet long; and No. 49, on the west side, has a length of 643 feet. All four berths have a depth of 26 feet alongside.

Coal Mole has five berths, Nos. 50 to 54, alongside the Coal Quay, northwestward of Old Coal Mole, with a total length of 2,100 feet; No. 50 has a depth of 24 feet, No. 51 of 25 feet, No. 52 of 27 feet,

Digitized by Google

No. 53 of 28 feet, and No. 54 of 30 feet, outside floating pontoons. A railroad runs on to the mole.

Mahmudiyeh Canal leads from the Inner Harbor, northeastward of the inner end of the Quai du Mahmudiyeh, to Atfeh, on the Rosetta branch of the Nile and about 15 miles above the town of Rosetta. It was constructed in 1819–20, is about 50 miles long and tortuous, with a breadth varying from 27 to 44 yards; the greatest depth of water is 8¾ feet, and it is less during the period preceding the rise of the Nile. The draft of the Nile boats, of which the maximum tonnage is 300, is not more than 5½ feet; navigation is slow and difficult. The canal is much used for transporting heavy and bulky merchandise. The canal has two locks.

Tides.—It is high water, full and change, in Alexandria Harbor, at about 10 h. 5 m.; springs rise 1 foot, neaps 3 inches. Strong westerly winds cause the water to rise 1½ feet above the level of ordinary high water and nearly 3 feet above the low level caused by easterly gales.

From the records of the self-registering gauge at Mahmudiyeh Canal, it appears that there are two regular tides every 24 hours, with a range of about 9 inches at springs and 4 to 5 inches at neaps. There is a slight diurnal inequality more marked at neaps than at springs. The alteration in the mean level, probably caused by wind, amounts to about 9 inches. The mean level of the sea in August, September, and October is 7 inches higher than in February, March, and April.

There is an automatic tide gauge at the northwestern end of the Coal Mole.

Harbor regulations.—No vessel is to proceed at a rate greater than 10 knots when in the Outer Harbor, nor greater than 5 knots when rounding the Coal Mole and in the Inner Harbor.

All in-going vessels are to hoist the quarantine flag and their number before rounding the Outer Breakwater, and are to keep the former flying until pratique is obtained and the latter until they arrive in the Inner Harbor, or for a reasonable time after anchoring in the Outer Harbor.

All vessels arriving from an uninfected port, and having no sickness on board, may proceed into the Inner Harbor, where they will be boarded by the quarantine officer, but they are not to go alongside the quays until pratique has been obtained.

All vessels arriving from an infected port are to anchor in the quarantine ground in the Outer Harbor, north-northeastward of the Timber Quays, where the medical visit will be made.

Should the quarantine office receive information that a port has become contaminated with plague or cholera, the pilots will be advised, and every week the pilot department is supplied by the quarantine office with a list of ports or harbors which are infected with

Digitized by Google

those diseases. The production of bills of health is obligatory at all times by vessels arriving in an Egyptian port, and only those delivered within 48 hours previous to departure will be considered valid.

Declaration of arrival will be obtained from all vessels on arrival. Vessels entering the harbor between 8 a. m. and 5 p. m. will be boarded on arrival, and vessels entering after 5 p. m. will be boarded the next morning, but no vessel will be boarded before she has received pratique.

Any vessel arriving with fire on board will not be permitted to enter the Inner Harbor, but will be taken to such anchorage as the harbor master may direct.

When a vessel has powder or other explosives on board, a red flag by day and a red light at night are to be hoisted before entering the Outer Harbor. Vessels with explosives or petroleum on board are to anchor in the Outer Harbor, and are not allowed in the Inner Harbor.

Vessels alongside the quays are not to lay out hawsers to the buoys, except in emergency or in a case to be approved of by the director general or harbor master, and all hawsers laid out are to be cast off from the buoys as soon as possible after the work for which they were required is finished. Vessels leaving are not to lay their hawsers out until one hour before departure.

Hawsers are not to be used to keep vessels off the quays except in unusually heavy weather; anchors are to be used for this purpose.

When necessary, captains of vessels must double their moorings, and take such precautions as are prescribed by the harbor master or his assistants. Vessels anchoring in the harbor must mark the anchor with an anchor buoy.

Shipping companies and owners, conjointly with the captains of the vessels, will be held responsible for the observance of the above regulations, and for any collision or damages which may result from the infringement of them.

Application for a berth alongside a quay, or for permission to secure to a buoy, must be made to the director general of ports and lighthouses on P. L. Form No. 180 (supplied gratis to shipping agents and captains on request). If a particular berth is required, the vessel first entering the harbor will have the prior claim, and should that vessel be placed in quarantine, the next in order of entering will take precedence of others. No vessel will be forced to take any particular berth if it is not desired by the agent or captain.

As regards moving vessels from place to place in the harbor, either at the quays or at the buoys, or taking them to a new anchorage, the requirements of the port administration will be notified direct to the commanding officer of the vessel for the time being, who is to carry out the orders according to the directions given.

Digitized by Google

Police.—The port police office is situated at Ras el Tin, westward of the palace, and there is a suboffice at the Marina landing stage. The port police launches fly a red pennant with the word "Police" in white letters.

Vessels requiring assistance from the port police should hoist International Code Signal Y. N.

It is strictly forbidden to throw ashes, manure, sweepings, etc., into the harbor. When the services of a lighter are required for the removal of ashes or rubbish, a basket should be hoisted at the masthead, or a request made by letter addressed to the officer commanding port police, and, if possible, delivered the day previous to that on which the lighter is required.

A vessel requiring the port police fire brigade, who supply the fire float, uses the following signals:

By day.—The International Board of Trade distress signal N. H. or continuous sounding with any fog signal apparatus.

At night.—A gun, or explosive signal, fired at intervals of about one minute.

The city.—Alexandria is the most important city in the eastern part of the Mediterranean. The ancient city was founded in the year 332 B. C. by Alexander the Great, who called it after his own name; it stood a little southward of the present town, and its magnificence was so remarkable that the Romans ranked it next to their own capital. Pompey's (Diocletian's) Pillar is still left, and there are several other remains in a ruinous state. In 1517, when it was taken by the Turks, its former splendor vanished, the buildings were reduced to ruins, and in 1778 its population was about 6,000. Under Mehemet Ali (1805–1849) the city recovered, and a large part of the commerce of Egypt now passes through it.

The population of Alexandria in 1907 was 332,246, of which 80,000 were foreigners.

Alexandria was very strongly fortified before its bombardment by the British fleet in 1882. In addition to several forts inside the city walls, a chain of forts, redoubts, and round towers crowns the heights around and extends westward several miles along the shore to the great fortification which commences at the Tabia-el-Mex or Old Canal Fort and stretches across the narrow isthmus between Lake Mareotis and the sea, the level of which in August is 13 feet higher than that of the lake, when the latter dries 1 or 2 miles from its banks. The large Fort Ajemi is 3 miles farther eastward on the western point of the harbor, and close northeastward of it is Marabut Islet, which is a fort.

Consul.—The United States is represented by a consul, and vice and deputy consul.

Digitized by Google

Signal station.—The signal station at Fort Napoleon (Kom el Nadoura) is a group of dwellings on the top of a hill, about 600 yards eastward of the middle of the eastern shore of the Inner Harbor, and 140 feet high, with a flagstaff and time ball; vessels are signaled when sighted. Communication can be made by the International Code.

Time signals.—The signals are made by a black ball, 115 feet above the sea and 15 feet above the ground at Fort Napoleon Signal Station:

(1) The ball is dropped, electrically from Cairo, at noon Egyptian standard time, or 22 h. 00 m. 00 s. Greenwich mean time.

(2) The ball is dropped, electrically from Cairo, at 1 h. 0 m. 0 s. p. m. Alexandria mean time, or 23 h. 0 m. 27 s. Greenwich mean time.

Should the first signal fail, International Code Flag D will be hoisted, and the ball kept up for the second signal.

Should the second signal fail, it will be repeated at 1 h. 5 m. 0 s. Alexandria mean time, or 23 h. 5 m. 27 s. Greenwich mean time.

A gun is fired at the instant of the signal at noon standard time.

Climate.—The climate of Alexandria is warm, but tempered by the prevailing northwest and northerly winds between May and October. The remainder of the year is usually fine.

Winds.—In summer the wind is generally fresh from the northwestward during the day, causing the sea to break on the reefs; it moderates after 3 p. m., and a land breeze follows at night.

Southerly winds, called khamsin, are laden with clouds of fine sand from the desert, the air becomes reddish, and objects at any distance are obscured.

In winter west and northwest winds prevail, and in autumn and spring variable moderate winds, but usually from north and northeast.

Gales generally last from three to four days, the wind being from the southwest on the first day, and veering to the northwest or north on the second day, and remaining from that direction. The heaviest gales generally occur in January and February.

Storm signals are exhibited from Ras el Tin Lighthouse about 3 p. m. daily, and indicate that a gale may be approaching as shown below; their exhibition can not be guaranteed on Fridays and Government holidays.

Signal.	Signification.
Cone, point upward	Gale commencing from between west and north.
Cone, point downward	Gale commencing from between south and west.
Two cones, one above the other, points upward	Gale commencing from between north and east.
Two cones, one above the other, points downward	Gale commencing from between east and south.
Two cones, basis together	Very heavy gale.

Trade.—The exports in 1913 were rice, sugar, cotton, cotton seed, cigarettes, eggs, ivory, ostrich feathers, barley, oil cake, beans, onions,

Digitized by Google

wool, hides, etc.; the imports were cotton fabrics, coal, timber, iron and ironware, hosiery and clothing, flour, meal, petroleum, rice, fruits, machinery, etc.

At Alexandria, cotton pressing, seed crushing for oil, beer brewing, and tanning are carried on; cigarettes, common soap, artificial stone, and sandbricks are made; salt is found near the suburb of Mex.

Supplies.—The Alexandria Waterworks Co. has installed a water service on the quays, and supplies shipping with filtered fresh water, which is good for drinking and also for boilers. It is put on board vessels alongside the quays by hose and on board those in the harbor by water-tank boats. Bullocks and sheep can be procured at moderate prices, and fowl, vegetables, fruit, etc., are plentiful.

Coal.—About 60,000 tons of Welsh and North Country coal are usually in stock, and several firms keep a stock of patent fuel. Coaling is performed alongside the coal quays at rates up to 400 tons an hour. The railroad administration possesses six transporters for the rapid discharge of coal; the buckets contain 1¼ tons, and each makes about 28 passages an hour over a distance of about 50 yards.

Tugs.—Three tugs of from 300 to 600 horsepower belong to the port administration, and two tugs of 300 and 350 horsepower to the pilotage corporation.

Docks.—See Appendix I.

Repairs.—Large repairs to machinery can be executed by the Khedivial Mail Steamship Co. at the arsenal, and by Autofage & Co.; small repairs by the Alexandria works and the lighthouse works. Vessels of 700 tons can be built. Ten tons of iron can be melted and run at one time; cylinders of 48 inches diameter can be cast and bored up to 5 tons of metal; boilers of 10 feet diameter can be made, and those of any size repaired; shafts of 7 inches diameter and 40 feet in length can be forged and turned; pipes of any size can be brazed, masts made, and boats built; propellers up to 10 tons can be cast.

The Khedivial Steamship & Graving Dock Co. have two wharves 320 and 328 feet long, with depths of 17½ and 20 feet alongside, respectively. The wharf crane of the company can lift 20 tons, the floating crane 18 tons. The port administration have several cranes, the largest capable of lifting 50 tons. There are four floating sheers belonging to the port plant, with a capacity of 40, 20, 10, and 6 tons, respectively.

Sailors' home.—There is a sailors' home, with good accommodation, situated on the quay near the entrance to Mahmudiyeh Canal.

Diseases.—The prevailing diseases are ophthalmia and cholera; the natives suffer greatly from the former, but Europeans are not so subject to it. Cholera, when it occurs, rages with great violence; during the epidemic from June to August, 1865, the death rate

Digitized by Google

reached 22¼ per 1,000 population. The plague occasionally makes its appearance in the first half of the year, the last occasion being in the summer of 1900.

Hospital.—There is a large hospital, where seamen are received, near the Place des Consuls.

Communication.—There is a railroad to Cairo, with branches to Damietta, Ismailia, Port Said, and Suez; also a railroad to Ramleh and Rosetta.

Alexandria is in telegraphic communication with all parts of the world. Besides the land lines, telegraph cables are laid to Malta; Sitia, in Crete; Larnaka, in Cyprus; and Port Said.

The coast of the peninsula, on which the city of Alexandria is situated, trends northeastward 1.9 miles from Eunostos Point to Pharos Castle, and reefs lie generally from ¼ to ½ mile off it.

Shoals.—A shoal with 4½ fathoms water was reported in 1876 to lie 1¾ miles 332° from Pharos Castle; it was searched for unsuccessfully by the British naval vessel *Caryefort* in May, 1888.

Bittern Shoal, a patch of 5 fathoms, lies 1,800 yards 7° from the northeastern extremity of Pharos Castle.

New Port (Eastern Harbor), on the northeastern side of the peninsula on which the city of Alexandria is situated, is entered between Pharos Castle and the Pharallon, which is near the end of Silsili (Silsileh), a low rocky point, projecting about 700 yards northwestward from the coast, about 1 mile to the eastward; the port is circular in shape, but is much encumbered by rocky patches and sand banks.

Diamond Rock, above water, lies about 200 yards northeastward of Pharos Castle. Yarf el Wasat, with 2½ fathoms water, lies 300 yards eastward of Diamond Rock. Shoal water extends nearly ½ mile west-northwestward from the Pharallon. El Hassan, a patch with 2¾ fathoms water, lies ¼ mile northward of the Pharallon.

Occasionally vessels shelter in the port from southwest and westerly gales, but the anchorage is bad and should only be used temporarily, for northwest, north, and northeast winds throw in a heavy swell, and the holding ground is not good, being sand, rock, and weed.

Mooring buoy.—A red mooring buoy lies about 500 yards southward of the southeastern extremity of Pharos Castle.

Directions.—To enter New Port pass either eastward of Yarf el Wasat or between it and Diamond Rock. There is also a passage about 150 to 200 feet wide, with 3¼ fathoms water, between Diamond Rock and the Pharos. The best anchorage is in about 4 fathoms water with the eastern side of Pharos Castle bearing 335° and the Pharallon 80°, avoiding El Ganem, a rock with less than 6 feet water,

Digitized by Google

situated nearly 200 yards south-southeastward of the southeastern extremity of Pharos Castle.

The coast from the eastern side of New Port trends northeastward 11 miles to Bourg Fort, on the extremity of the western point of Abukir Bay, and is low and sandy, with several buildings on it. It is skirted by rocks and shoal water, which in places extend 1¼ miles from the beach.

About 3 miles west-southwestward of Bourg Fort and 1¼ miles offshore is a rocky patch (Ibn Assil), with less than 6 feet water. Breakers were reported in 1908 1.8 miles westward of the eastern extremity of Bourg Fort; a rock with less than 6 feet water, marked "P. D.," has been charted in the position, which has not been examined; a patch with 3 fathoms water lies 300 yards east-northeastward of this position. A patch formed by ruins, with 1½ fathoms least water, lies 1.3 miles west-northwestward from Bourg Fort; there is said to be about 1 foot water on the shoal at times; the sea always breaks on it.

Sultan Shoal, with 28 feet water, lies 2.2 miles 353° from the eastern extremity of Bourg Fort.

Abukir Bay is situated between Bourg Fort and the western point of the Rosetta Mouth of the River Nile, 16 miles northeastward, the land between, which is very low and sandy, forming a semicircle.

Nelson Island, nearly 2½ miles northeastward from Bourg Fort, is 600 yards long east and west, narrow, and moderately high, with two small peaks. From the western part of the island a reef of sunken rocks extends about ¾ mile south-southwestward; there are depths of from 22 to 42 feet between this reef and the reefs eastward of Bourg Fort.

Culloden Shoal.—Patches of rocks and shoal water extend 1½ miles northeastward from Nelson Island; Culloden, the outer of these shoals, has 16 feet water and 5 to 10 fathoms close outside, but there are depths of from 22 to 30 feet for 800 yards to the eastward.

Islets and shoals.—Several islets and rocks, above and below water, extend ½ mile northeastward from Bourg Fort. Within 1½ miles eastward of the outer of these islets are several patches with from 12 to 7 feet water, and for 1.6 miles farther eastward the depths vary between 13 and 22 feet. The whole of the bay southeastward of these shoals and Nelson Island has depths between 14 and 24 feet, decreasing toward the shore, but there are numerous patches of from 8 to 13 feet, for which see the chart.

Soundings.—The 10-fathom curve from about 800 yards northward of Culloden Shoal trends northeastward to about 5 miles off the western point of Rosetta mouth, and the bay, northeastward of the shoal water in its southwestern part, has general depths of from 10 to 5 fathoms to about 1 mile from the shore.

Digitized by Google

Directions—Anchorage.—From the westward keep well northward of Sultan Shoal, Nelson Island, and Culloden Shoal, in depths of from 20 to 11 fathoms, until the eastern fort, near the closed entrance to Lake Edku, on the south shore of the bay, bears 167°; then keep this mark, which leads about ¾ mile eastward of Culloden Shoal, on, and when Nelson Island bears about 270° steer toward it, and anchor a large vessel, with the island bearing between about 270° to 280°, distant 1¼ miles, in from 42 to 60 feet water, sand bottom, observing that shoal water and foul ground extend about 1,400 yards eastward of the island.

In a small vessel, bring the quarantine staff in range with the southern end of Bourg Fort Tower, 246°, and keep this mark in range until the eastern peak of Nelson Island is nearly abeam, when steer west-northwestward, and anchor in from 21 to 24 feet, with the eastern peak of the island bearing about 350°, distant 1,300 yard. There are several anchorages off the town and along the western shore, in about 3 fathoms water, sheltered from westerly winds, but local knowledge is necessary to reach them.

Abukir village is on the west shore of the bay, about ½ mile southwestward of Bourg Fort. There is a railroad station here on the line between Alexandria and Rosetta.

A tall chimney in the southwest corner of the bay is conspicuous.

Edku village lies about 1 mile inland from the middle of the shore of the bay, and there are several windmills in front of it.

The River Nile, a few miles northward of Cairo, divides into two main streams, which enter the Mediterranean by the Rosetta and Damietta Mouths; the area inclosed between the two branches is the present delta of the Nile.

The annual rising of the Nile with its inundations (to which Egypt owes its prosperity) generally commences at Cairo about the end of June, but sometimes two or three weeks later; it continues about two months, and then gradually subsides. At this time the river rises from about 14 to 29 feet, when some 1,046,000,000 cubic yards of water pass Cairo every hour and flow into the Mediterranean. It carries a great quantity of sand and mud, which discolors the sea for many miles. Occasionally the discoloration assumes the appearance of a shoal. The alluvial matter is taken away by the general easterly current, and forms the banks and shoal water along the coast to the eastward.

Rosetta Mouth, the entrance to the western branch of the Nile, is about ½ to ¼ mile broad; it is nearly barred by extensive mud and sand banks, which extend about 1½ miles outside the entrance, and partly dry. A very narrow channel, with 7 feet water, lies between the banks about 1¼ miles northwestward of Rosetta Light-

Digitized by Google

house; the depth quickly increases to 12 and 20 feet as the river is entered, and is maintained for many miles.

On each side of the river, about 1 mile within the entrance, is a small fort. The town of Rosetta is beautifully situated in the midst of palm groves and gardens, on the western bank 8 miles from the mouth. The town, the population of which was 14,000 in 1908, has greatly declined since Alexandria has increased in importance, and many of the houses are in a ruinous state. There is a railroad between Rosetta and Alexandria. Mosquitoes are very troublesome here.

Light.—An alternating red and white light is exhibited, at 180 feet above high water, from a lighthouse on the western side of the Rosetta Mouth. The lighthouse, painted white, is an iron tower with two supports, forming a tripod; the lantern is painted black. Visible 20 miles. (See Light List.)

Caution.—Shoal water extends 2¼ miles northward of the lighthouse. The depths off Rosetta Mouth are reported to have shoaled considerably.

Cape Brulos (Brullos) is 34 miles eastward of the eastern point of the Rosetta Mouth, and the coast between, which makes a slight bend to the southward, is very low and sandy. Maestaro, about 18 miles eastward of the eastern point of Rosetta Mouth, and Maksada, 2¾ miles farther eastward, are two sand hills, which are good marks when near the land. The small outlet of the extensive Lake Brulos is at Cape Brulos, and through it, during the inundations caused by the rise of the Nile, a large quantity of water flows into the sea. On the western side of the outlet is a conspicuous round fort, and on the eastern a village and several windmills, one of which is very large and noticeable.

Shoals.—A patch with 5 fathoms water lies 3¼ miles 307°, and a patch with 4½ fathoms water 1¾ miles 353° from the round fort on the western point of the outlet at Cape Brulos.

The coast from Cape Brulos trends east-northeastward 6 miles to Brulos Lighthouse, and is low sand hills.

Shoals.—A shoal with 3½ fathoms water, hard sand, and from 4½ to 6 fathoms around, lies 3 miles 312° from Brulos Lighthouse. Breakers have been seen on the shoal during a moderate northerly wind.

Light.—A fixed white light is exhibited, at 180 feet above high water, from a red iron tower, with two supports, the eastern white, the western black, forming a tripod, and the lantern red, situated 6 miles eastward of the cape, on the northernmost part of the low sandy coast of the delta of the Nile. Visible 20 miles. (See Light List.)

Digitized by Google

The coast from Brulos Lighthouse curves gradually east-southeastward and east-northeastward 40 miles to the Damietta Mouth of the River Nile, and is low sand hills.

Damietta Banks, nearly in the middle of the bay thus formed, are three in number, and run parallel to the coast.

The outer bank, about 6 miles long east and west and ½ mile broad, has depths of 6 and 7 fathoms, but a patch with 5 fathoms water lies at its eastern end with Damietta Lighthouse bearing 122° distant 9¾ miles, and 8½ miles from the shore; the middle bank is 8 miles long and from ½ to 1¼ miles broad, with depths of from 5 to 8 fathoms, but at its eastern end is a large patch with 3 and 4 fathoms water, the 3-fathom head lying with Damietta Lighthouse bearing 103° distant 8½ miles; and the inner bank, about 3 miles long, east and west, and 1 mile broad, with from 3 to 5 fathoms water, is 4 miles offshore, and from its eastern end the lighthouse bears 86°, distant about 10¾ miles.

There are depths of from 7 to 10 fathoms in the channel, about ¾ mile wide, between the outer and middle banks; of from 7 to 9 fathoms in the channel, 1¾ miles wide, between the middle and inner banks; and southward of the inner bank the depths decrease from 6 to 7 fathoms to the shore.

Rosetta to Damietta—Bottom.—Near the coast the bottom is principally sand, of a quartzose or siliceous nature, dark colored, heavy, and quite different from the sand westward of Abukir Bay, which is light in color and formed of coral and shells.

Current.—The current is uncertain, but generally sets eastward at a rate of from 1 to 1½ miles an hour, and after strong westerly winds occasionally as much as 2 miles, with an indraft setting strongly into the bays; near the land the current is more influenced by the winds and with northeasterly winds often sets westward.

Directions.—It is advisable not to approach Cape Brules Lighthouse nearer than 8 miles, nor to less than 12 fathoms, particularly eastward of the lighthouse; steer to pass about 5 miles northward of the 5-fathom patch of the outer Damietta Bank, and in the vicinity of these banks do not shoal the water to less than 14 fathoms. Damietta Lighthouse (or light) bearing 139° leads 3 miles northeastward of the 5-fathom patch of the outer bank. The lead should be kept going while in the vicinity of this coast.

Damietta Mouth is the entrance to the eastern branch of the Nile. The western bank is a low sand spit, the outer part of which has 1 to 2 feet water, extending rather more than 2 miles northward from the Tabiet el Gharib. The mouth between the end of this spit and Kawa Burun, the low sandy eastern entrance point about 1 mile east-southeastward, is nearly filled by a sand bank, partly awash. A very narrow channel, with a shifting bar and from 3 to 7

Digitized by Google

feet water, lies between the sand spit and the sand bank, and there is a similar channel, also with a shifting bar, and from 1 to 3 feet water, between the sand bank and a bank northward of Kawa Burun. A heavy surf breaks on the banks, and communication with the river is frequently stopped for several days. The river deepens considerably inside the bar, there being 4 fathoms abreast the Tabiet el Sherkh, and there appears to be a least depth of 2½ fathoms to Damietta town. Shoal water extends 2 miles northward of Kawa Burun.

On the eastern side of the entrance is the Tabiet el Sherkh, and the lighthouse, both conspicuous, and visible from seaward before the land; on the same bank 1¼ miles farther up is the much larger Tabiet el Esbe.

Light.—A revolving white light is exhibited, at 180 feet above high water, from an iron tower with two supports, forming a tripod, all painted black and white in bands, and the lantern white, situated on the eastern side of the entrance to the Damietta Mouth of the Nile. Visible 20 miles. (See Light List.)

Caution.—The depths off the Damietta Mouth for a distance of some 7 miles from the lighthouse were reported in 1910 to be considerably less than shown on the chart. Caution is necessary in approaching Damietta Lighthouse, as shoal water extends 3½ miles northward and about 5 miles northeastward of it, and there is an occasional indraft; the lead must therefore be constantly used. Damietta Light has been mistaken for that of Port Said; attention is therefore required to the characters of the respective lights.

Anchorage.—Damietta is a rice-growing district; country vessels often anchor northwestward of the river bar in about 5 fathoms, and their cargoes are taken out in large boats. During westerly winds they frequently shelter under Kawa Burun, where they are also out of the easterly current.

At the period of highest Nile the water of the river is so charged with alluvial matter that the wind can hardly raise it into waves, and the swell from the northward is completely arrested by it. It has been observed that when there was a heavy swell of a height of 6 feet from trough to summit outside the Nile water, inside this water and on the bar no swell was experienced. The period of high river is locally known as the Mishta season, and trading vessels then anchor very close to the bar in a depth of about their own draft.

Pilots.—There are three pilots attached to the port who, when a vessel is entering, remain in the channel at the entrance and indicate the passage. When the mouth is closed by bad weather, the lighthouse will exhibit International Code Flag V.

Damietta town, once the emporium of Egypt, is situated on the eastern bank of the river, 8 miles from the entrance. It is sur-

Digitized by Google

rounded by palms and sycamore trees, but presents a poor appearance. Like Rosetta, it has much declined since Alexandria has increased in importance.

There are two high towers in the town which are visible from seaward. The population was estimated at 34,109 Egyptians and 262 foreigners in 1913.

Trade and industries.—Rice, fish, and cotton seed are exported, and wood, tobacco, cereals, oil, and charcoal are imported. Seed crushing for oil, rice husking, fish salting and curing are carried on.

Railroad.—There is a railroad from Damietta to Tanta, where it connects with the main line between Alexandria and Cairo.

Damietta to Port Said.—The coast from Kawa Burun to Port Said, 28½ miles southeastward, curves slightly to the southwestward, and forms the Bight of Debeh. The shore of the bight is a strip of very low sand, in places about 200 yards wide, which separates the great Lake Menzaleh from the sea. At 15 miles from Kawa Burun are the ruins of the square Fort Debeh, at the ancient Mendesian Mouth of the Nile, now closed.

About 8 miles southeastward of Debeh and 6 miles westward of Port Said is the Ghemil entrance to Lake (Beheira) Menzaleh; the channel is about 100 yards wide with 4 feet water on the bar, deepening inside to 17 feet for about 700 yards, when it again becomes shallow; on the low reddish sandy coast on the western side of the entrance is Fort Ghemil, a low round building.

The 5-fathom curve is from 2½ to 5 miles, and near Port Said about 2 miles offshore, within which the depths decrease gradually toward the land.

Caution.—The soundings outside the 10-fathom curve can not be depended upon, depths of from 6 to 8 fathoms having been reported off Damietta and Port Said.

Tidal streams.—A tidal inflow and outflow has been observed at Ghemil; the ingoing stream sets along the coast from the westward and enters Lake Menzaleh obliquely; the outgoing stream issues at a great rate after high water and carries with it quantities of mud.

Currents.—The current off the coast generally sets eastward, but it frequently turns toward the land; this deflection sometimes appears to be produced by the wind. The distance offshore at which the current caused by the Nile water from the Damietta Mouth is experienced varies considerably without apparent cause. A strong eddy setting northwestward has been observed along the coast between Kawa Burun and Fort Debeh, and at the same time the current outside, as well as close along the shore, was setting strongly eastward.

Port Said—Approach.—The coast in the vicinity of Port Said is unusually low, only the lighthouse, town, and shipping being seen

Digitized by Google

from the offing. At 6 miles westward of the lighthouse the coast is marked by Fort Ghemil.

Port Said Lighthouse is reported to be more or less obscured during strong southwesterly winds, when sand is being blown about.

Two pillar beacons, each painted white and black and surmounted by a ball, are situated on the coast about 2 and 4 miles eastward of Fort Ghemil.

The most conspicuous marks at Port Said are Port Said Lighthouse and the three water towers, each 98 feet high, with conical tops and painted gray; the Eastern Exchange, a large square red block building with five flagstaffs on its roof; and the offices of the canal company, a white square stone building with three green domes.

A large black beacon stands in 1 fathom water about 800 yards southeastward from the inner end of the East Breakwater, and the salt works, a white building on piles with a white dome, are situated a little distance inland on the sands eastward of Port Said. On the coast about 3 miles eastward of the lighthouse is a beacon, a masonry column, 17 feet high, painted lower part white and upper part black, and surmounted by a staff.

Current.—The current off the coast is very uncertain, depending on the wind; it generally sets east-southeastward at a rate of from ½ to 1½ miles an hour. Owing to the current and the low coast, caution is necessary in approaching the port.

Outer anchorage.—The best anchorage off Port Said is in 39 feet, with the extremity of the West Breakwater in range with Port Said Lighthouse, or a little open of the lighthouse on either side. The bottom is mud and very good holding ground, but the sea here is sometimes very heavy.

Port Said.—The harbor is formed by two concrete breakwaters extending from the sandy shore. The West Breakwater extends 1.3 miles northeastward from the western entrance point of the harbor, and for a distance of 427 yards from its root is solid stonework; with the exception of a short length, situated about 600 yards farther out, which is also of solid stonework, the remainder is constructed of artificial blocks of concrete, cast indiscriminately, the outer 600 yards being awash. Great interstices thus occur, and in winter, after heavy gales, some blocks are found displaced, but these are rectified in summer. The submerged portion of the breakwater is being continued 1.15 miles in a 33° direction.

The East Breakwater, the inner end of which is situated about 1,800 yards south-southeastward of the inner end of the West Breakwater, extends about 1.4 miles in a 12° direction.

The Central Mole commences about 500 yards southeastward of Port Said Lighthouse, and extends nearly 400 yards parallel to the

Digitized by Google

East Breakwater and 850 yards westward of it, into a depth of 12 feet; it shelters the harbor from easterly winds.

Channel.—The entrance channel to Port Said is straight, and its axis trends 217°; its length from the outer buoys to Port Said Lighthouse is 3 miles, and its breadth decreases from about ¼ mile to about 90 yards.

The channel has been dredged from seaward to a depth of 36 feet, but the depths in the channel abreast of and outside the end of the West Breakwater are liable to change.

Dredging operations to maintain a least depth of 35 feet in the fairway are always in progress.

Ismail Basin or the Inner Harbor is about 1 mile long northeast and southwest, with a breadth of from 250 to 550 yards and depths over 32¾ feet; on its northwestern side are three basins, named Commercial, Arsenal, and Cherif. Commercial Basin, the outer one, has a depth of 19½ feet, Arsenal Basin of 19½ feet, and Cherif Basin is being dredged to a depth of 31 feet.

Within and southeastward of the Central Mole is a large basin with depths of from 14 to 26 feet water.

From about 300 yards within the Central Mole four islands extend 1 mile southwestward; on the three inner islands (first, second, and third) are coal stores. Between the islands and the land to the southeastward is a coaling basin for lighters. On the northwest side of second island is the berth for vessels with explosives.

Abbas Hilma or Africa Basin is southwestward of Ismail Basin and on the western side of the canal entrance; it is chiefly used by vessels staying some time in the port, such as colliers, to relieve the harbor in front of the town from being inconveniently crowded. There is a general depth of 28 feet in this basin.

Petroleum basin.—On the east bank, opposite Abbas Hilma Basin, is a small basin for the use of vessels with petroleum; the entrance is protected by iron floating booms. There is a depth of 28 feet in this basin.

New coaling basin.—A basin for colliers has been constructed southward of Abbas Hilma Basin by widening the canal sufficiently to made the east bank about 382 yards from the axis of the canal; the basin is about 710 yards long.

Petroleum Basin.—A second basin for vessels with petroleum has been constructed on the east bank of the canal about 600 yards southward of the New Coaling Basin; it is about 382 yards long and 131 yards wide.

A station of 382 yards has been made between the New Coaling Basin and the Petroleum Basin for vessels with liquid fuel.

Caution.—The canal company do not dredge in or around the harbor, except in the channel and basins; the depth is continually

Digitized by Google

altering, therefore the depths shown on the charts may not be correct.

Lights—Port Said.—A flashing white light is exhibited, at 184 feet above high water, from an octagonal stone tower, 180 feet high, with time ball on roof, situated close to the inshore end of the West Breakwater. Visible 20 miles.

East Breakwater.—A flashing red light is exhibited from the outer end of the East Breakwater.

Central Mole.—A flashing red light is exhibited from the outer end of the Central Mole. Visible 3 miles.

Lake light.—A fixed red light is exhibited from a black iron framework tower, 62 feet high, on the northeast side of Abbas Hilma Basin. Visible 8 miles. (See Light List.)

Cherif Basin.—A light is exhibited from a floating beacon off the southeastern extremity of the basin.

Abbas Hilma Basin.—A light is exhibited from a perch southward of the basin.

Occasional lights.—Lights are occasionally shown from the lookout at the canal company's office, for aiding the navigation of the canal at night.

Lightbuoys.—The channel into Port Said is marked by five pairs of lightbuoys; the buoys on the northwestern side are painted red, and each exhibits a fixed green light; those on the southeastern side are painted black, and each exhibits a fixed red light.

The outer pair of lightbuoys, which are 500 yards apart, are situated 3 miles northeastward of Port Said Lighthouse.

The outer extremity of the prolongation of the West Breakwater is marked by a red lightbuoy, showing a flashing green light; it is moved as necessary to mark the extremity of the works in progress.

Buoys.—The channel within the inner pair of lightbuoys is marked by red can buoys on the northwestern side and by black can buoys on the southeastern side.

Anchor lights.—Vessels moored in Port Said Harbor carry the usual anchor lights, but those moored at right angles to the banks must carry the forward white light at the extreme head of the vessel, at a sufficient height for it to be clearly visible.

Tides.—It is high water, full and change, in Port Said at about 10 h. 0 m.; springs rise 1½ feet. The rise is much affected by wind and sea.

Sea level. The height of the mean sea level at Port Said varies with the seasons; in February, after a continuance of westerly, southerly, and southeasterly winds, the sea is at its lowest level, and in July, after a continuance of northerly winds, it is at its highest. The mean difference, however, due to these causes does not exceed 9 inches. Northerly gales occasionally raise the level 1 foot, and

Digitized by Google

rarely 2 feet, above the previously existing level. During a period of six years the difference between the highest and lowest levels observed amounted to 4½ feet.

The mean sea levels at Port Said and Suez are identical.

Pilots and pilot signals.—All vessels of over 300 tons gross measurement must take, on entering or leaving Port Said, a pilot of the canal company, who will furnish all particulars as to the course to be steered. The company have the right to send either a pilot or a master to vessels of less than 300 tons.

The pilot vessels are steamers, and their funnels are painted black with a white band; the word "Pilote" is painted on each bow; the vessels carry International Code Flag S, and at night three red lights vertical at the masthead.

A vessel requiring a pilot to enter Port Said by day should hoist International Code Flag S, or her national pilot flag, and at night hoist lights at the foremast head and fire rockets or burn blue lights.

The above will be thus answered:

If the state of the sea permits the pilot vessel to go out—

By day.—International Code Flag S. at the pilot vessel's masthead..... *At night.*—A white rocket.....	The pilot is going out to you.

Should the sea prevent the pilot boarding the vessel, the pilot vessel will make the following signals when near her:

By day.—International Code Signal N. G. S..... *By night.*—A blue light.....	Follow the pilot vessel; the pilot will come on board under the lee of the breakwater.

Should the sea prevent the pilot vessel going out:

By day.—International Code Signal T. J. P. hoisted at Port Said Lighthouse.. *At night.*—A red rocket.....	The pilot vessel can not go out.

Vessels in the harbor requiring a pilot by day hoist International Code Flag S, or the national pilot flag; and at night hoist three lights vertically at the foremast head. A vessel must give previous notice of her intention to leave the port.

Directions.—Lake Mensaleh Lighthouse, seen midway between the lines of red and black lightbuoys marking the sides of the channel, bearing 217°, leads to the entrance; thence keep midway between the lines of these buoys and the buoys marking the channel inside them, where the channel has been dredged to depths over 33 feet.

Digitized by Google

Vessels entering the channel from seaward, especially in heavy weather, should give a good berth to the black buoy, showing a red light, situated on the eastern side of the channel, 1,400 yards northeastward of the outer end of the East Breakwater, to avoid being set on the bank eastward of the channel. During strong westerly winds the current passes the outer end of the West Breakwater and sets across the channel at a rate which sometimes attains 4 miles an hour; under the breakwater a weak current then sets northeastward.

Should the sea prevent the pilot coming on board a vessel, he will when near her, make the signal to follow the pilot vessel; it is then necessary to follow her closely to enter the harbor. But as the pilot may be unaware of the draft of the vessel, it is for the captain's consideration as to whether he can follow with safety, or if he should keep at sea, or anchor.

No vessel should attempt to enter when the pilot vessel is prevented by the weather from going out.

A vessel entering in heavy weather, without a pilot, should steer about 217° from well outside the outer lightbuoys to midway between them, proceeding at a speed of about 10 knots, and then pass close to the northwestern buoys; when under the lee of the West Breakwater, the speed can be reduced and a pilot taken on board.

No vessel of heavy draft should attempt to enter Port Said during a westerly gale, especially at night.

If there are any dredgers at work in the channel, they must be passed on the side indicated by their signals.

The pilots, on coming on board, should be informed of the draft of the vessel; many of the pilots speak very little English, and in cases some have given their orders in the French way.

Vessels moor head and stern in the harbor.

Mooring buoys.—Several sets of mooring buoys are laid down in the harbor for the use of the mail steamers. Vessels are allotted berths by the officials of the canal company.

Caution.—Vessels are forbidden to sound steam sirens in any part of the port, and steam whistles are only to be sounded as alarm signals in cases of serious danger.

Salutes.—Naval vessels are requested not to fire salutes or guns in any part of the port or the canal, according to regulations. Salutes are permitted outside the harbor, but they should be fired when well clear of the outer light buoys, as the buoys have been damaged through the firing having occurred close to them. Vessels saluting the Egyptian flag on entering or leaving the port will have the salute returned by the battery situated on the shore close westward of the West Breakwater.

Digitized by Google

Signals.—There is a Lloyd's signal station at Port Said Lighthouse.

Vessels arriving are signaled at the canal company's office. When they are sighted a square blue flag is hoisted, and when made out, if a naval vessel, the national ensign is hoisted at the yardarm, and if a merchant vessel, the flag of the company to which she belongs.

Signals by certain vessels.—The following signals must be hoisted on entering Port Said:

By mail steamers: A blue flag with the letter "P" in white in the middle by day, and a white light at night.

By tank steamers carrying petroleum, oil, or other petroleum products in bulk: When the petroleum has a flash point below 73.4° F., a ball above a red flag by day, and a white light under two red lights at night.

When the petroleum has a flash point between 73.4° and 150.8° F., a red flag over a ball by day, and two red lights over one white light at night.

By steamers with explosives on board: A ball over a red flag by day, and one white light over two red lights at night.

By vessels under compulsory quarantine: A yellow flag by day, and a red light at night.

By vessels under voluntary quarantine: Two yellow flags, one over the other, by day, and two red lights, placed vertically, at night.

By vessels with coal cargoes for Port Said: International Code Flag J by day.

Dredger signals.—The following signals are exhibited by dredgers:

A cylinder at the yardarm by day, and a white light at the masthead, with two white lights placed horizontally on one side of the bulwark, at night, indicate that the passage is clear on the side shown.

A cylinder at both yardarms by day, and a white light at the masthead, with two white lights placed horizontally on both sides of the bulwark, at night, indicate that the passage is clear on both sides.

Two cylinders placed vertically at the yardarm by day, and a red light at the masthead at night, indicate that the passage is not clear.

Storm signals.—The following storm signals are made at Port Said Lighthouse by day only, about 3 p. m., but their exhibition is not guaranteed on Fridays and holidays:

Signal.	Signification.
Cone, point upward	Gale commencing from between west and north.
Cone, point downward	Gale commencing from between south and west.
Two cones, one above the other, points upward	Gale commencing from between north and east.
Two cones, one above the other, points downward	Gale commencing from between east and south.
Two cones, bases together	Very heavy gale.

Digitized by Google

Silt at Port Said.—The current from the mouths of the Nile, setting eastward, deviates on striking the West Breakwater; one part turns northward and rounds the head of the breakwater, while the other penetrates through the spaces between the blocks and forms a bank of sand along the eastern side of that breakwater.

Periodically the canal company displaces the blocks at the inner end of the breakwater, so that the current may pass through and deposit the sand on its eastern side, as it is easier to dredge the sand away from here than at the northern end of the breakwater.

The coast westward of the inner end of the West Breakwater has advanced seaward about 600 yards since 1860, and there is now a broad road running along it in front of the English hospital, outside which is a sandy beach about 50 yards wide, and increasing.

The town of Port Said, situated on the western side of the harbor, is well laid out, the streets being bordered with trees. It is lighted by both gas and electric light. The place has been considerably improved of late years, Government offices, barracks, prison, Roman Catholic Church, the Suez Canal Co.'s offices, and many houses having been built; there is an English hospital, British seamen's hospital, Egyptian Government hospital, a sailors' boarding house, and sailors' rest.

Parallel with the line of railroad which has been laid between Port Said and Ismailia is a fresh-water canal. The town is supplied with water from Ismailia through pipes laid alongside the canal, a distance of 43 miles.

The population is estimated to be 57,404 in 1913. Some 47,000 are natives, the majority of whom are engaged loading and discharging coal; 1,800 are British, and the remainder are Europeans of almost every nationality.

The languages most spoken at Port Said are English, French, Italian, Greek, Arabic, and Maltese. English is very generally understood by Government and other officials.

Consul.—The Unites States is represented by a consular agent.

Quarantine—Plague.—The health officer boards vessels as soon as they enter the port. The presence of the first case of bubonic plague at Port Said was officially declared in 1900; there were 25 cases in 1913. The quarantine regulations at European ports on all arrivals from this country apply to Port Said as well as to Alexandria. Vessels are permitted to pass through the canal in quarantine without communicating with the shore, and passenger steamers and some cargo steamers do so, if plague or cholera exists in Egypt. The canal pilot remains on board during the whole transit of the canal.

The quarantine station is situated on the east bank of the Suez Canal, between the second and third milestones; there is also a floating quarantine office in Abbas Hilma Basin.

Digitized by Google

Hospital.—There is a hospital, subsidized by the Eygptian Government, where sick seamen can be received.

Time signals.—A black ball is hoisted, 5 minutes before the signals, at an iron lattice-work mast, 30 feet high, surmounting Port Said Lighthouse, and dropped three times daily, at 8 h. 0 m. 0 s. a. m., noon, and 4 h. 0 m. 0 s., standard time, or mean time of the meridian of 30° east longitude, or 18 h. 0 m. 0 s., 22 h. 0 m. 0 s., and 2 h. 0 m. 0 s., respectively, Greenwich mean time.

The ball, which is 4½ feet in diameter, is 199 feet above high water, 192 feet above the ground, and has a drop of 4½ feet.

Should the signal fail, a red and white checkered flag is shown from the top of the lighthouse, but the signal is not repeated until the next regular time for making it arrives.

The time signal is electrically connected with the observatory at Helwan, near Cairo.

Chronometers can be compared at any time on application at the port office.

Coal.—About 100,000 tons of coal are usually in stock at Port Said. It is placed on board, the vessels being at moorings about 30 yards offshore, in quantities up to 2,500 tons in 24 hours, according to bunkers and trimming, from special lighters, the natives employed keeping up a thick and continuous stream with coal baskets. Coaling is rarely impeded by the weather.

The amount of coal imported into Port Said in 1913 was 1,957,323 tons. There is no coal wharf.

Supplies of all kinds can be obtained. Water is brought alongside in steam lighters fitted with steam pumps; it is obtained from the canal from Ismailia, and, being filtered through sand at the waterworks a little southward of Abbas Hilma Basin, is very good. A large quantity can be supplied by giving a few days' notice.

There are good manufactories of artificial block ice.

Trade.—The principal exports are cigarettes, hides, wool, salt, and salt and smoked fish; and imports flour, coal, soap, horses, mules, asses, and camels, metal and metal wares, raw silk and thread, mixed tissues of jute, cotton, wool, flax, and silk, ready-made clothes, and preserved and salt meat.

Docks.—See Appendix I.

Repairs.—Large repairs to machinery can be executed by the Suez Canal Co., who possess three cranes of 35 tons, one of 8, and two of 6 tons; also an 8-ton and two 3-ton floating sheers. There is a large smithy with steam hammers of 1½ to 4 tons. Castings up to 4 tons can be made, cylinders of 60 to 72 inches diameter can be cast and bored, boilers of any size repaired, 7½-inch pipes brazed, and shafting of 12 inches by 15½ feet forged and turned. There are two brass furnaces.

Digitized by Google

There is a waterside frontage to the works of 450 yards, with not less than 19 feet alongside at low water.

The canal company's works are on the eastern side of the harbor.

Messrs. Dowrie & Co. execute large repairs to machinery and boilers; boilers of 72 inches diameter can be made, shafts 15 inches by 14 feet or 10 inches by 20 feet turned, pipes 18 inches in diameter brazed, masts made, and boats built. There are three brass furnaces; lathes will take work of 5 feet radius.

Messrs. Vignetta & Co. are also able to effect heavy repairs; they have several lathes, also one 8-ton and two 3-ton floating sheers. There are two brass furnaces; 800 pounds of brass can be cast daily.

Communication.—Port Said is in communication with all parts by steamer and telegraph. A railroad connects Port Said with Ismailia and thence with the Egyptian railroad system. A telegraph cable is laid between Port Said and Alexandria.

Radio.—A radio station, open to the public at all times, is established at the Navy House, Cherif Basin, Port Said; the call letters are S. U. B.

Menzaleh Canal.—A deep and wide channel has been dredged across Lake Menzaleh, between Port Said and Matarieh, and a daily service of ferryboats runs in cooperation with the light railroad between Matarieh and Mansura, on the Damietta Branch of the Nile. The channel has been continued from Matarieh to the Nile, a little above Damietta.

Winds.—The heaviest gales at Port Said are from the southwestward, but being offshore they produce no sea. West, northwest, and north winds prevail at Port Said and in the canal during winter; the West Breakwater at Port Said then affords protection from the sea. During summer the northeasterly sea breezes are very regular and blow fresh in the afternoon.

Suez Canal.—The Suez Canal, which is entered from Ismail Basin, is described in H. O. No. 157 Red Sea and Gulf of Aden Pilot.

Bay of Tineh or Pelusium.—The coast eastward of the inner end of Port Said East Breakwater trends southeastward 16 miles to Tineh or Pelusiac Mouth, and thence eastward 7 miles and northeastward 22 miles to Kas Burun.

The coast is extremely low, the part from 7 miles eastward of Tineh Mouth being a very narrow sand strip separating Lake Sirbon (Sabakat Bardowal) from the sea.

Tineh, the great bay thus formed, is very shallow, the 5-fathom curve being 7 miles from Tineh Mouth; on the eastern side are several sand banks with from 2 to 4 fathoms water; the outer one, 3 miles long northeast and southwest, with from 3 to 4 fathoms water, lies with its northeast extremity bearing 327° 10 miles from Kas Burun.

Digitized by Google

Depths of 6 and 7 fathoms have been obtained 14 miles 322° from Kas Burun, 8 fathoms 2 miles farther northward, and the 10-fathom curve was reported, in 1914, to be about 6 miles northward of its charted position.

Kas Burun (ancient Casius Mons), the eastern point of Tineh Bay, is a small but remarkable range of sand hills 270 feet high; here the sand strip separating Lake Sirbon from the sea is 1 mile broad.

An obstruction has been reported (1914) 3 miles northwestward of Kas Burun.

The coast from Kas Burun trends eastward 16 miles to Ras Mahatib, and is a narrow and very low sand strip, which continues 9 miles farther southeastward, between Lake Sirbon and the sea. There are some huts on the sand strip 6¼ miles eastward of Kas Burun. The coast from 9 miles southeastward of Ras Mahatib trends eastward 13 miles to El Arish, and is low and sandy. There is a palm grove about 5 miles westward of El Arish.

Sand banks.—A number of sand banks, with from 2 to 4 fathoms water and depths of from 5½ to 9 fathoms between, lie off the coast between Kas Burun and Ras Mahatib; the banks extend 8 miles north-northeastward from Kas Burun and about 2 miles northeastward of Ras Mahatib; a narrow shoal, with from 2 to 3 fathoms water, extends 2½ miles southeastward from 1½ miles northeastward of the cape. Eastward of these banks the soundings decrease gradually to the beach; abreast El Arish the 5-fathom curve is about ½ mile from the shore.

Shoal.—A shoal with depths of 8 fathoms, and with depths of 10 fathoms about ½ mile to the eastward, has been discovered about 15 miles northwestward of Kas Burun, in (approximately) latitude 31° 25′ 45″ N., longitude 32° 56′ 15″ E.

The British naval vessel *Doris* touched in 23 feet of water 3 miles northwestward of Kas Burun, in (approximately) latitude 31° 15′ 40″ N., longitude 33° 03′ 52″ E.

NOTE. –The bank northwestward of Kas Burun is reported to have extended to the northward and to have shoaled considerably.

The depths in the vicinity of Kas Burun and out to the 10-fathom curve have decreased considerably and the anchorages shown on the chart have been removed.

El Arish, the small frontier town of Egypt, and fort, is situated in a valley, behind palm trees and sand dunes, about 1¾ miles from the beach; the fort is flat topped, with a flagstaff in the middle, and a white minaret on its eastern side is conspicuous. Landing can be effected with but little difficulty in moderate weather, an outer bar of sand, on which the sea breaks, running parallel to the shore for some distance.

Digitized by Google

Current.—The current off El Arish appears to set eastward at a rate of about ¾ mile an hour, decreasing to about ½ mile outside the banks.

Caution.—The coast between Port Said and El Arish, a distance of 77 miles, with the exception of Kas Burun, is extremely low, with many shoals extending far off it, and navigation requires the greatest caution, particularly in autumn and winter, when north to west winds prevail and often blow hard. In February and March dense fog is not uncommon. The lead is the only guide, and must be constantly used; the depth should not be reduced to less than 10 fathoms, but between the meridians of 33° and 33° 20′ E. longitude, not below 20 fathoms, as the 10-fathom curve approaches the outer shoals off Kas Burun very closely.

Digitized by Google

Digitized by Google

CHAPTER XI.

COAST OF KARAMANIA—CAPE ALUPO TO KARADASH BURNU.

Cape Alupo (ancient Cynossema Promontory) is the southern extremity of the long and narrow peninsula which separates the Gulfs of Doris and Symi from Rhodes Channel. The coast of the peninsula from Cape Alupo trends generally east-northeastward 19 miles to Cape Marmarice; it is steep, rugged, and rises to a range of limestone mountains some 1,500 feet in average height. There are numerous ancient and Middle Age ruins on the land.

Rock.—A sunken rock lies at the base of Cape Alupo, therefore do not round the cape closely.

Port Aplotheka is nearly 2 miles eastward of Cape Alupo, and there are several bold points on the coast between. The port extends northwestward ¾ mile, with a width of about ¼ mile, and the depths decrease from 33 fathoms in the entrance to 11 fathoms near the head, where there is anchorage. A rock, above water, lies close to the shore just within the western entrance point, and sunken rocks lie at the base of the eastern entrance point; the interior of the harbor is clear. The ruins of a large fortress stand on a rocky barren ridge northwestward of the port, and the extensive ruins of the ancient town Loryma are on the shores around the port.

Supplies are limited, and not to be depended on, and the only water to be obtained is brackish.

Ipsera Island.—The coast from the southern entrance point of Port Aplotheka trends eastward ½ mile to a point, close off which are several rocks and an islet. Ipsera Island, ¼ mile southward of the point, is separated from the islet just mentioned by a passage about 200 yards wide, with 10 fathoms water in mid-channel.

Port Sertcheh.—The coast from Ipsera Island trends northeastward 1¼ miles to the entrance to the small Port Sertcheh (ancient Sersa), which is only available for small vessels.

Prinari Bay.—Cape Prinari is about 1¾ miles eastward of Port Sertcheh, and Prinari Bay extends ¾ mile northward between them; its shores are steep and rocky, and there is no anchorage. The ruins of the ancient Phœnix are on the summit of a mountain, 1,780 feet high, situated 1½ miles northeastward of the bay.

Kum Burnu, the northeastern extremity of Rhodes Island, bears 139°, 9¾ miles from Cape Prinari; it is low, sandy, and steep-to; there are a number of windmills on it.

Digitized by Google

Lights.—A fixed red light is exhibited, at 53 feet above the sea, from a mast on a white house situated about 280 yards within Kum Burnu. Visible 6 miles.

A flashing white light is exhibited, at 82 feet above the sea, from a white tower 82 feet high, in Fort St. Elmo, Rhodes Harbor, about ¾ mile southward of Kum Burnu. Visible 14 miles. (See Light List.)

Channel.—The channel between the coast from Cape Alupo to Elesa Island, on the northwest, and Rhodes Island, on the southeast, is nearly 10 miles wide, deep, and clear. The current generally sets westward.

Caution.—In winter southerly winds prevail, and are accompanied by cloudy weather and thick haze, when caution is necessary in navigating the channel just mentioned.

Elesa Island.—The coast from Cape Prinari trends northeastward, and 2 miles from the cape and 600 yards offshore is Elesa Island (ancient Elœussa), with a deep and clear passage between it and the land.

Araba Islet (Arap Adasi).—The coast between Elesa Island and Cape Aspro-mitas, 7 miles northeastward, continues high, rugged, and steep-to, and there is an anchorage under the rocky Araba Islet 3 miles northeastward of Elesa Island, but it is small, and available for boats only.

Chiflik Island.—A point juts out about ½ mile from the coast ½ mile northward of Cape Aspro-mitas, and Chiflik Island (ancient Phalarus) about 1 mile farther northeastward, and close offshore, lies in the entrance to a small but snug cove about ½ mile deep, with from 13 to 3 fathoms water, which is frequented by boats from Rhodes for firewood.

Water.—A limited supply of water can be obtained here, even in summer, by digging on the beach.

The coast between Chiflik Island and Pandion Point, about 2 miles to the eastward, falls back 1 mile to the northward, forming a deep bay, the shores of which are high, precipitous, and steep-to, but foul ground extends a short distance off Pandion Point.

Cape Marmarice (ancient Posidium Promontory), 1 mile northeastward of Pandion Point, is the southwest point of the bay, at the head of which is Marmarice Harbor; it is of moderate height, but a very picturesque mountainous range rises immediately behind it and attains an elevation of from 2,700 to 2,900 feet.

Lights.—Two fixed white vertical lights are exhibited from a mast over a white dwelling with a red roof, situated 54 yards within the cape. Visible 12 miles. (See Light List.)

The coast.—Immediately northward of Cape Marmarice a small bight, the mouth of which is about 600 yards wide, extends westward

Digitized by Google

800 yards, and thence the coast trends north-northwestward 1,600 yards to Paridion Point. Between Paridion Point and the southeast point of Kumlubek Bay, nearly 600 yards northwestward, some rocks above water extend nearly 200 yards offshore.

Kumlubek Bay.—The northwestern point of Kumlubek Bay is nearly 1 mile northwestward of the southeastern point; the bay is about 1,400 yards deep, and open to the northeast, but it affords good anchorage in from 9 to 17 fathoms sand, sheltered from northwest, through west, to south. A heavy swell sets in with southeasterly gales.

The ruins of Asarjik (ancient Samus) are situated on a cliff on the northwestern point of the bay.

The coast.—Karghi Adasi, an islet 39 feet high, lies about 700 yards north-northeastward from the northwestern point of Kumlubek Bay; it is steep-to, excepting on the south side; ¼ mile westward of the islet is a high rocky point with shoal water extending nearly 400 yards northeastward from the coast 400 yards northwestward of it. About 1,600 yards northwestward from the point is the entrance to a snug little cove, where coasting vessels take in cargoes of wood, honey, and corn. Thence to the western entrance point of Marmarice Harbor, a distance of ¾ mile, the coast trends northward, with several indentations and rocky points between.

Nimada Peninsula, which shelters Marmarice Harbor from the southward, is irregular in shape, about 1¾ miles long east and west, and 1½ miles broad; it rises to a hill in the middle, 1,354 feet high, and is connected to the eastern shore by a shingly isthmus about 250 feet wide. The hill is covered with pine trees, and on its summit are the ruins of a fortress.

Passage Island, westward of Nimada Peninsula, is irregular in shape, about ¾ mile in extent, 603 feet high, and West and East Passes, which lead into Marmarice Harbor, are on either side of it.

Light.—A fixed red light is exhibited from a mast over a white dwelling with a red roof on Adasi Burnu, the southern extremity of Passage Island. Visible 6 miles. (See Light List.)

West Pass is circuitous, and Kaia Rock, well above water, lies nearly in mid-channel, but it is otherwise deep and clear to about 200 yards from the shores. The pass, eastward and northward of Kaia Rock, has a least width of about 500 yards.

East Pass, between Passage Island and Nimada Peninsula, is 1 mile long and nearly ½ mile broad; it is straight, and the shores are high, precipitous and bold-to, excepting a small rocky shoal which extends 100 yards from the shore 600 yards southward of the north point of the island.

Marmarice Harbor (ancient Physcus) extends about 2¼ miles northward of Nimada Peninsula, with a greatest breadth of 3½

Digitized by Google

miles and depths of from 20 to 7 fathoms. It is landlocked, and affords secure anchorage, with good holding ground. The shores are steep-to and the harbor is clear, excepting on the northwestern side, where a flat with 3 fathoms and less water extends off 600 yards. The mountains on the western side of the entrance are high and picturesque, but the northwestern shore is bounded by a plain, with several small streams running through it in winter, which are nearly dry in summer. Long Island, on the southern side of the harbor, about 400 yards northward of the middle of Nimada Peninsula, is ½ mile long east and west, about 200 yards broad, and steep-to. The passage between it and the peninsula is deep and narrow.

The village situated at the head of the harbor, 2¼ miles north-northeastward of East Pass, is some miserable houses, placed without any regularity on a rocky eminence; there is an ancient fort on a hill 1¾ miles northwestward of it.

The Turkish flag is flown from the customhouse. A three-storied house, painted yellow, with a red roof, is situated near the shore about 800 yards westward of the village.

There is a mole, with 4 feet water alongside it, on the southwestern side of the village, and a pier, also with 4 feet water alongside it, on the shore about 800 yards farther westward and near the barracks.

The country around the village is fertile but thinly inhabited. Its principal productions are honey, turpentine, and timber. The surrounding mountains are covered with pine trees, which, from difficulty of transport, are only available as firewood.

Supplies.—Beef, poultry, and eggs are obtainable. Cattle and provisions can be procured from the interior and vegetables from Rhodes, with which place, when weather permits, there is daily communication. Water can be had in abundance; there are two springs in an inclosure eastward of the village; in winter it can be obtained from any of the streams which flow into the harbor; there are also a few small springs on the western side of the harbor.

Coal.—No coal is kept in stock.

Telegraph.—A cable is laid to Rhodes. The cable is landed in the bay 1½ miles southward of Adasi Lighthouse; connection thence by land lines to Marmarice and Smyrna.

Caution.—A sailing vessel can not generally get out of the harbor during southerly winds, as there is then a heavy swell and the wind is very unsteady in the narrow passages, coming down the ravines in squalls and eddies.

False Bay is a deep bight on the southeastern side of Nimada Peninsula and southward of the narrow isthmus joining the peninsula to the main. When approaching Marmarice Harbor at night the lights in the village, or from vessels in the harbor, may be seen over the isthmus.

Digitized by Google

The coast from the isthmus at the head of False Bay trends east-southeastward 4 miles to a point, about 200 yards off which is Black Rock, above water, with foul ground close around and between it and the shore. The coast then turns eastward to Chatal Burnu, the southwestern entrance point of Karaghatch Harbor, a distance of little more than 1 mile.

Edmonds Rock, a small patch with 2 feet least water, on which the sea generally breaks, lies 1 mile southwestward from Chatal Burnu. There is a clear passage between the rock and cape.

Caution.—A current, varying in direction, has been observed to set over Edmonds Rock at a rate of from ½ to 1½ miles an hour.

Linosa Island (ancient Rhodussa), the western point of which lies about 1½ miles southeastward of Chatal Burnu, extends thence ¾ mile east-northeastward, with a greatest breadth of 800 yards; it is 327 feet high and steep-to.

Bank.—A patch, with 19 fathoms water, marked "Ocean, 1909," on charts, and from 35 to 70 fathoms around, lies 1½ miles 166° from the southeast point of Linosa.

The coast from Chatal Burnu trends north-northeastward 3.2 miles to Inek Burnu, and is the western shore of the channel leading to Karaghatch Harbor. It is bordered by rocks and shoal water to the distance of 200 yards in places, and some high conical rocks with foul ground outside extend 200 yards off a point 1,200 yards southward of Inek Burnu.

Skizo Burnu lies 3 miles east-northeastward of Chatal Burnu, and from it the eastern shore of the channel leading to Karaghatch Harbor trends northward 2.4 miles to Koioun Burnu; shoal water and foul ground extend less than 200 yards off it in places.

Karaghatch Harbor (ancient Cressa) is separated from Marmarice by a mountainous peninsula 5 miles long and 3 miles broad, over which is a rugged path. The channel leading to the harbor is about 1½ miles long and about 1 mile broad.

The harbor, northward of Inek Burnu, turns westward 2¼ miles, and has a general width of a little less than 1 mile; it affords secure anchorage in from 10 to 25 fathoms, good holding ground. Uruk Cove, on the northern side, is well sheltered, and vessels might repair here.

Two rocks lie off a point situated 1.3 miles north-northeastward of Inek Burnu; the inner rock is 12 feet high, and the outer one, which is about 200 yards off the point, is 2 feet high, and the water is shoal inside it.

East Islet ¾ mile northwestward of Koioun Burnu and 200 yards off the north shore, is 191 feet high, and bordered for about 100 yards by shoal water; there is also shoal water between it and the north shore.

39148—16——34

Digitized by Google

A bay about ¾ mile in extent, with from 12 to 21 fathoms water, lies eastward of East Islet, and a bay about 800 yards wide and ¾ mile deep, with from 18 to 7 fathoms water, lies north-northeastward of the islet.

Karaghatch Harbor is better than Marmarice for sailing vessels requiring shelter, as from the width of its entrance it can be entered in any weather and left when the weather moderates.

Supplies.—Live stock may be obtained from a wandering tribe which frequents Uruk Valley, and firewood can be cut close to the sea in the western anchorage.

Water is very plentiful at any season in the bay in the northeast part of the harbor; there is also a convenient watering place in the southern part of the bay on the east side. In winter the streams are numerous.

Skizo Bay lies between Skizo Burnu and a point 1.4 miles east-southeastward, and extends 1 mile northeastward to a sandy beach, off which there might be good anchorage in southeasterly winds, but the bay is open to the southwest.

The coast from the southern point of Skizo Bay trends southeastward nearly 1 mile to Orta Burnu, 250 yards south-southwestward of which is a rock awash. A bay extends about 1,200 yards northeastward between Orta Burnu and a point ¾ mile east-southeastward, whence the coast trends east-southeastward 1,600 yards to Kezil Burnu, which is bordered to the distance of about 200 yards by rocks above and below water.

Keugezi Bay, the entrance to which lies between Kezil Burnu and a point about 2¾ miles east-northeastward, extends about 1½ miles to the northward and has depths of from 40 to 17 fathoms; it is open to the southward, but Ekinjik Harbor, on its northern side, is a little anchorage, safe for small vessels in any weather.

An islet lies close southward of the eastern entrance point of the bay and off the mouth of Keugezi River, on the right bank of which and about 2¼ miles inland are the ruins of the ancient city Caunus; the walls and rock tombs of the city are conspicuous from seaward.

The coast from the eastern point of Keugezi Bay trends southward 6½ miles to Kapnia Burnu, and is a succession of bays separated by bold rocky points. The water in the northern of these bays shoals gradually, and in its southern part is some foul and rocky ground; the other bays have deep water.

Keugezi Lake, the water of which is brackish, lies 4¼ miles north-northeastward of Keugezi River mouth; it is 6 miles long northeast and southwest, and from 1 to 3 miles broad, with depths of from 3 to 14 fathoms. A small village lies on the northeast shore. Yuvalaki Chai, which during winter is a large stream, flows into the lake on the eastern side, and the lake communicates with the sea by

Digitized by Google

Keugezi River, which flows out of its southern end, and passes through marsh and swamp.

Fish.—A great quantity of mullet are caught in Keugezi River, and when dried and salted are sent to Rhodes.

Anchorage.—There is good summer anchorage near the islet off Keugezi River mouth, in from 3 to 9 fathoms water, sand and mud. Here vessels load with wood, Indian corn, and wheat, which are brought down the river in boats. Near the islet the depths decrease gradually to the shore.

Kapnia Burnu is high and bold, rising steeply to a hill 1,340 feet high, ½ mile to the northward. Between the cape and Seira Burnu, 2 miles eastward, a bay extends 1½ miles to the northward; the water in the bay is deep, and it affords no anchorage.

Dalamon Bay lies between Seira Burnu and Sphena Burnu, 6½ miles east-southeastward, and it extends 1¾ miles north-northeastward.

Papas Islet, 1 mile eastward of Seira Burnu and 600 yards offshore, is nearly ½ mile long east and west, and narrow. Small vessels shelter inside it, but southerly gales send in a heavy swell. On the summit of the island is a large brick pyramid, most probably a tomb, and on the adjacent coast are many ruins, both Hellenic and of the Middle Ages.

There is no anchorage in Dalamon Bay eastward of Papas Islet, the shore, though low, being steep-to, with shoal water extending about 400 yards off the northeastern shore from about 1½ miles eastward of the mouth of Dalamon River.

Dalamon River, which is very rapid, flows into the sea 1½ miles eastward of Papas Islet; it passes through an extensive plain, which affords pasturage to numerous flocks of sheep and goats.

Rothea Islet, 2 miles southwestward from Sphena Burnu, the eastern extremity of Dalamon Bay, is about 300 yards long northeast and southwest, narrow, 106 feet high, and steep-to.

Suvela Burnu (ancient Artemisium Promontory) is the southern extremity of a rugged and bold peninsula which rises to Mount Suvela, a peak 1,650 feet high, 1½ miles northward of the cape. The northwestern side of the peninsula is connected to the main by a narrow isthmus; an irregular-shaped neck of land projects about 1¾ miles northeastward from the eastern side of the main part of the peninsula, and on its inner side are several coves, but all too deep for anchorage, excepting Kapi Cove, where coasting vessels resort for wood.

Paximadi Islet, about 1¾ miles southwestward of Suvela Burnu, is small, 86 feet high, steep-to, but the ground between it and the burnu is very uneven and rocky, the depths varying from 19 to 200 fathoms.

Digitized by Google

Iero Adasi, close northward of the northeastern extremity of Subela Peninsula, is about 1½ miles long northwest and southeast, ½ mile broad, and 850 feet high. The passage between the peninsula and island is about 400 feet wide, with 9 fathoms in mid-channel, and safe. A rocky shoal, with 5 fathoms least water, lies about 800 yards southeastward from the entrance to the passage.

Tersaneh Adasi, about 400 yards eastward of Iero Adasi, is about 1½ miles long northeast and southwest, with a greatest breadth of 1¼ miles, and 805 feet high; the channel between the islands has a least depth of 25 fathoms in the fairway, but, the wind being generally baffling, no square-rigged sailing vessel should attempt to pass through. On the summit of the island is a small well-cultivated plain, and a small harbor on the northern side affords good anchorage. There is a village on its shores amongst extensive ruins. Tobacco is grown on the adjoining mainland.

Stavro Islands, 1 mile northward of Tersaneh, with a very deep-water channel between, are a group of islands and rocks. St. Kiriaki Island, northward of the group, affords pasturage to a few goats.

Skopea Bay.—The coast of the mainland from Suvela Peninsula Isthmus trends northeastward 7¾ miles and is much indented. Skopea Bay, between it and the above-mentioned islands, is a large extent of water, but it is too deep for anchorage excepting in several creeks where small vessels shelter. Remains of the Middle Ages are plentiful in this locality. There is scarcely an island, bay, or creek without the ruins of some building on it or its shores.

A rocky shoal, with 14 fathoms water and from 23 to 80 fathoms around, lies 1¼ miles west-northwestward of the northern extremity of Tersaneh, and a similar shoal, with 10 fathoms water and 25 to 44 fathoms around, lies ½ mile farther northwestward.

An islet, with a group of rocks northward of it, lies nearly in the middle of the bay 1½ miles northward of Tersaneh.

Kujik Creek in the northern extremity of Skopea Bay is small, but its western part is well sheltered; in the outer part a considerable swell rolls in with southeast gales, but not sufficient to endanger a vessel.

Supplies.—Water and live stock can be obtained here in winter, but in summer the streams dry and the inhabitants resort to the mountains.

Iniji River.—A high rugged cape lies 1,600 yards east-southeastward of the eastern extremity of St. Kiriaki Island, and Iniji River flows southwestward into a small bay eastward of it. The valley through which the river runs is well cultivated, and on a hill on the northwestern side of the valley, about 2 miles within the river mouth, are the ruins of an ancient city, probably Dædala, where numerous

Digitized by Google

tombs, hewn out of the rock and in the Lycian style, are to be seen, besides remains of immense walls, etc.

Gulf of Makri.—The entrance to this gulf (ancient Glaucus Sinus) is between Suvela Burnu and Cape Angistro, nearly 8½ miles east-southeastward. The gulf trends northeastward about 10 miles, and on its eastern side is a deep bay having in its southeastern part the harbor of Makri.

The coast from Iniji River trends southeastward 1¾ miles and is high cliffs which are steep-to and rise to the hills about a mile inland. The cliffs then turn eastward on the north shore of a small bight, into which a river flows. A moderately high point, with foul ground about 200 yards off its western and southern sides, separates the bight just mentioned from a bight to the southeastward, and from the eastern point of this bight the coast becomes low and marshy and trends southeastward about 4½ miles to Makri Harbor.

A rocky patch, with 14 fathoms water and from 30 to 51 fathoms around, lies ½ mile off the coast and 1 mile southward of Iniji River mouth.

Avthoki Island, ½ mile off the point, 2½ miles southeastward of Iniji River mouth, is rocky and barren, and foul ground extends 400 yards from its southeastern end.

Isabel Rock, 1.7 miles 207° from the northwestern point of Avthoki Island, is two small rocky patches with 2¼ and 4 fathoms water, extending about ¼ mile east and west.

The southern part of Flat Hill, which is situated on the western shore of Skopea Bay, in range with the northern extremity of Tersaneh Adasi, bearing 271°, leads northward, and Red Peak in range with the middle of Avthoki Island, bearing 199°, leads eastward of the rock.

The rock is surrounded by rocky ground, with depths of from 22 to 61 fathoms.

Kazil Islands, 1½ miles southeastward of Avthoki Island, are a rocky group; the southern and largest, which is 530 feet high, supports a few goats, and among the cliffs are numbers of pigeons.

A rock, on which the sea generally breaks, lies 500 yards west-northwestward from the small northern islet of the group. The channel between these islands and Avthoki is clear, but the bottom is rocky and uneven, with two patches of 12 and 20 fathoms water, respectively, and from 34 to 51 fathoms around.

Light.—A flashing white light is exhibited, at 105 feet above the sea, from a white stone tower, 41 feet high, on the southern point of the southern Kazil Island. Visible 15 miles. (See Light List.)

Anchorage can be obtained inside Kazil Islands in from 22 to 29 fathoms, good holding ground, well sheltered from the southward; it is much used by sailing vessels meeting contrary winds when bound southward from the Grecian Archipelago.

Digitized by Google

Supplies can be obtained here from Makri and Levisi towns, and water from the stream on the mainland northward of the islands, particularly in spring and winter.

Batraki Rocks, 1¾ miles east-northeastward of the southern Kazil island and ½ mile offshore, are a cluster of rocks a few feet above water and steep-to around; there is a clear channel between the rocks and the shore.

Sunk Rock.—Dactylo Point, 1.6 miles east-southeastward of the southern point of the southern Kazil Island, is the northern extremity of the peninsula which extends about 1½ miles northward on the western side of Makri Harbor, and 900 yards eastward of the point is Sunk Rock, which has 5 feet water; the rock is about 300 yards offshore.

Makri Harbor, in the eastern part of the Gulf of Makri, is land-locked and affords complete shelter. Cavaliere Island, which is about 1,200 yards long northeast and southwest, with a greatest breadth of 400 yards, 110 feet high, and covered with ruins of the Middle Ages, lies across the entrance to the harbor, and there is a passage on either side; the southwestern is the wider and better, but both are safe and clear. On the eastern side of the harbor the shore is low and marshy, and a bank of mud, which dries in places, extends off it 400 yards in the northern and 1,200 yards in the southern part, abreast of the town.

Light.—A fixed red light is exhibited from a white iron column on the southwestern extremity of Cavaliere Island. Visible 3 miles. (See Light List.)

Directions.—In entering the harbor pass between the southern Kazil Island and Dactylo Point, on a 67° course; keep Cape Suvela open northward of Dactylo Point until Drepanaki Point bears 123° or is well open northeastward of the point ½ mile west-northwestward of it, which leads about 200 yards northeastward of Sunk Rock, when turn southeastward and steer through the southwestern passage into the harbor. Anchor as convenient in from 7 to 10 fathoms water, stiff mud, keeping on the western shore to avoid the mud bank off the eastern shore.

Merchant vessels usually haul in close to the landing place at the town to take in their cargoes, but the water here is shoaling, owing to the discharge of ballast.

The town is a collection of huts situated on the southern shore of the harbor in the middle of a marsh and surrounded by the ruins of ancient Telmissus; in front of the town is the scala or landing place.

The inhabitants only reside here during winter and autumn, when a considerable trade is carried on, and numerous vessels visit the port. From the end of May to October the place is deserted, it being so

Digitized by Google

unhealthful from the exhalations rising from the surrounding marshes that no one during this period will sleep here for a single night.

Supplies.—During autumn and winter, cattle, sheep, poultry, and bread can be obtained here, and the harbor abounds with fish. Water is very plentiful during winter, and an abundant supply can be obtained from any of the ravines on the western side of the harbor; there are also several springs of good water behind the town, but the clear water that issues from the rocks near the ancient theater must not be used, as it is said to be very unwholesome.

In summer, water can only be procured in small quantities from a spring close to the shore of a small bay south-southwestward of the southwestern end of Cavaliere Island.

Cape Angistro.—The coast from Dactylo Point to Cape Angistro, 7 miles south-southwestward, forms two bays, separated by a large projection 1,700 feet high, and it is bold and clear. Cape Angistro is the western extremity of a peninsula, the south coast of which trends eastward 2½ miles. Karazora Island, 300 yards southeastward of the eastern extremity of the peninsula, and St. Nikolo Island, about ¾ mile eastward of the northern end of the east coast of the peninsula, are covered with ruins. Rocky foul ground extends between the southeast point of the peninsula and the southern point of Karazora Island. In the channel, which trends east and west, and is about 200 yards wide, between St. Nikolo and the main, there is good shelter for small vessels.

Levisi Bay, ½ mile northeastward of St. Nikolo Island, extends northward about 1,200 yards, with a width of about 600 yards; foul ground extends off its eastern shore, and it is open to the southward.

Simbalu Cove nearly 1¾ miles to the eastward of St. Nikolo Island, is about 500 yards in extent, and affords secure anchorage in from 15 to 20 fathoms, mud; but the entrance, although easy of access, is only 150 feet wide, with a depth of 19 feet. The cove is much used by small coasting vessels.

The cove is the port of Levisi town, 1.3 miles north-northwestward, and situated on the southern side of a well-cultivated, elevated plain, which produces good wine and figs. The inhabitants of Levisi are Greeks, the majority being shoemakers, who leave their homes in summer and travel about the country working at their trade until winter.

The coast from Simbalu Cove trends generally southward to the northern extremity of the Seven Capes, a distance of 10 miles, and is lofty and bold, with several creeks in the southern part where small coasting vessels anchor when the sea breeze is very strong. The coast then trends southeastward 15½ miles to Kalamaki Point.

Digitized by Google

The Seven Capes are the extremities of the spurs from a range of rugged mountains, which attain a height of 3,300 feet and run parallel and close to the shore for about 7 miles. A sandy beach, with shoal water extending off about ¾ mile, trends southeastward from the southern of the Seven Capes to Etchen Chai (ancient Xanthus), a distance of 4½ miles. At 1½ miles farther southeastward are the ruins of the ancient city and port of Patara, and 2½ miles southeastward of Patara is the high Kalamaki Point, ¾ mile southward of which are Volos and Okhendra Islands.

Kalamaki Bay, eastward of Kalamaki Point, is about 3 miles wide at its entrance, and extends about the same distance northeastward; its shores are steep-to, but there are some rocks near the southwestern shore. From the great depth of water in the bay, and its being open to the southward, it is an inconvenient anchorage. Large polaccas, which touch here to complete their cargoes of corn, moor to the shore in the northeast cove; and caiques (small coasters) occasionally haul inside the rocks on the southwest side of the bay.

Jura Shoal, about 500 yards south-southwestward from the eastern entrance point of Kalamaki Bay, is about 30 feet long, with 2½ fathoms water.

The coast from the eastern entrance point of Kalamaki Bay trends eastward 10¾ miles to the head of Port Vathi, and is high and rugged.

Phournaki Islands, two in number, extend 1½ miles southwestward from close off the coast, 1½ miles eastward of the eastern entrance point of Kalamaki Bay.

Prason Island 1¼ miles south-southeastward of the southern Phournaki Island, is small, and steep-to around.

Rock.—A rock with 1¼ fathoms water lies about 1 mile offshore 2 miles eastward of the southern Phournaki Island. Okhendra Island open southward of the southern Phournaki Island 298° leads about ½ mile southward of the rock.

St. Georgio Island extends 1¾ miles eastward from its western end, which is situated 2¼ miles southeastward of Prason Island, and has a greatest breadth of ¾ mile; it is steep-to around, and on its southern side is an inlet with deep water, and on the northern a small bay with a sandy beach; close off the eastern end is the small Tragonera Islet.

Shoal.—A shoal with 3 fathoms water is charted 1¼ miles 132° from Tragonera Islet; its position is doubtful.

Marathi Island, about 2¼ miles northeastward from the eastern end of St. Georgio Island, is small.

Voutzaki Rocks, ¾ mile south-southeastward of Marathi Island and nearly midway between it and Kastelorizo Island, are small and ow, but steep-to.

Digitized by Google

Port Vathi lies between the mainland and Vathi Peninsula, which is narrow and extends 2¾ miles west-southwestward. The harbor is from about 1,500 to 500 yards wide, and there are two small rocks above water in the middle of the entrance, which can be passed on either side at the distance of 100 yards; there are depths of from 65 to 5 fathoms in the outer part of the harbor and from 25 to 7 fathoms in the inner part. The harbor is unsuitable for sailing vessels, but it affords sheltered anchorage to steam vessels.

Gulf of Kastelorizo lies between Kastelorizo Island and Vathi Peninsula on the west and north and the mainland on the east; it extends northward about 4½ miles, and several channels lead into it; Vathi channel, lying between the peninsula and Kastelorizo Island, is the best.

Port Longos on the northern side of the Gulf of Kastelorizo and 1½ miles eastward from Point Vathi, the western extremity of Vathi Peninsula, is an anchorage much used by small vessels. On the southern side of the port is an islet.

Port Sevedo, in the northeast corner of the Gulf of Kastelorizo, is more sheltered than Port Longos, but the water is inconveniently deep, and a spit extends about 200 yards northeastward from the entrance point. It is easy to enter and affords good shelter. From the head of the harbor a tongue of land projects like a pier, and there are 5 fathoms water close alongside the rocks at its extremity. Vessels either anchor or moor with hawsers to the shore.

Kastelorizo Island (ancient Cisthene or Megiste), 1¼ miles southward of the western part of Vathi Peninsula, is 3½ miles long northeast and southwest, with a greatest breadth of 1½ miles, and 825 feet high.

The population of the island is from 6,000 to 7,000, and nearly all the men are sailors.

Mandraki Harbor, on the northeastern side of the island, is a bight extending about 800 yards southwestward, with a width of about 200 yards and depths of from 7 to 4 fathoms; small vessels haul close in to the town, on the southeastern side, and large vessels lie alongside the shore on the northwestern side of the harbor. In entering keep in mid-channel, leaving Psoradia Island to the southeastward.

Eastward of the harbor are several small low islands, which form a well-sheltered roadstead, about 400 yards long east and west and a little more than 200 yards wide, with from 6 to 10 fathoms water, sand and mud bottom. The entrance to this anchorage is 250 yards wide, between Polyphidous and Agrielaia Islands; there is also a very narrow channel, with 4 fathoms water, close westward of Polyphidous Island.

Digitized by Google

Between Psoradia and Polyphidous Islands and westward of the channel just mentioned there are depths of from 2¼ to 3¼ fathoms, rocky bottom.

Pilots.—Merchant vessels going to or returning from Syria and Cyprus resort to Mandraki Harbor or the roadstead. Pilots may therefore be generally obtained here for all parts of the east end of the Mediterranean.

Supplies can be obtained to a moderate extent, but several days' previous notice is necessary, as the island is barren, and all the provisions required in the town are brought from the mainland. There are no springs in the islands, so the inhabitants depend on their reservoirs in summer, and it is difficult to obtain any quantity of water.

Islands and rocks.—There are upward of 20 rocks and islands of various sizes, some high and others just above water, in the Gulf of Kastelorizo, which may all be approached to about 200 yards, except Prassoudi, a small round island, lying 1,100 yards eastward of Agrielaia Island, from which a reef extends about 200 yards northeastward; and 300 yards southeastward from Prassoudi there is a patch of sunken rocks about 40 yards in extent, with 1¾ fathoms water. By the chart, the castle, on the red cliffs eastward of the town, open southward of Poinaki Island bearing 283°, leads nearly 200 yards southward of the patch of sunken rocks, and the southern extremities of Polyphidous and Strongylo Islands in range, bearing 262° lead about 200 yards northward of the reef extending northeastward from Prassoudi Island.

Vessels should not pass between the sunken rocks and Prassoudi Island on account of the currents, which are uncertain both in rate and direction.

The coast from a point 1 mile southwestward of the entrance point of Port Sevedo trends southeastward 3¾ miles to Tugh Burnu.

Hypsili Island, lying about 2¼ miles west-southwestward of Tugh Burnu and in the entrance to the Gulf of Kastelorizo, is about 1 mile long northeast and southwest, with a greatest breadth of 800 yards, 600 feet high, and steep-to; there are several islets between it and the main.

Light.—A flashing white light is exhibited, at 289 feet above the sea, from a white masonry tower, 33 feet high, on the southwestern point of Hypsili Island. Visible 20 miles.

Current.—The current setting westward on the coast of Karamania generally divides at Tugh Burnu, one part continuing westward and passing southward of Kastelorizo Island, while the other goes through the gulf and out of Vathi Channel, at the rate of from ½ to 1½ miles an hour. Sometimes the whole current sets westward, when part of it appears to pass southward and westward of Kastelorizo

Digitized by Google

Island, eastward through Vathi Channel, and then southward to the original current, which it joins.

The coast from Tugh Burnu trends east-northeastward 5 miles to the head of Assar Bay; it appears to be steep-to, but has only been partially examined.

Kar Boghaz, 4 miles eastward of Tugh Burnu, is the channel between an island and the western extremity of a peninsula; although narrow, it is navigable, but a strong eddy current has been noticed setting southeastward through it, and the winds are baffling. The peninsula, which has a greatest breadth of about ¾ mile, trends east-northeastward 3¾ miles and is connected to the shore by an isthmus, on the western side of which is Assar Bay and on the eastern Polemos Bay.

Kakava Island trends east-northeastward 4¼ miles from ½ mile eastward of the peninsula above mentioned; it has a greatest breadth of about 1 mile, and is 800 feet high. Three islets lie within 1,600 yards southward of the island, and Tragonesi Islet is on its southeastern side.

Kakava Road.—Between the peninsula just mentioned and Kakava Island is the entrance into Kakava Road. Karaool (Sentinels), a group of small islands, divides the entrance into two channels, each about 250 yards wide, with depths of from 16 to 34 fathoms in the fairway, but only a few soundings have been taken. The pilots prefer the eastern one, as they consider that the wind is more steady in it.

A rock, on which the sea often breaks, lies 200 yards north-northeastward from the western extremity of Kakava Island; it is about 30 yards in extent, and has 4 feet water. The western extremity of Kakava Island bearing eastward of 173° leads westward and the northern extremity of Karaool Islands bearing southward of 258° leads northward of the rock.

Kakava Roadstead is about 1½ miles northeastward of the western end of Kakava Island, and it affords anchorage in from 4 to 23 fathoms.

The most convenient berth for large vessels is southeastward of an old castle on a hill, 300 feet high, situated on the mainland; the holding ground is generally good. Rocks, some of which are above water, extend 300 yards offshore to the southward of the castle, and there is also a small patch of sunken rocks about 100 yards off the southwestern point of an islet on the eastern side of the road and 12,000 yards eastward of the castle.

The entrance to Kakava Road from the eastward is straight and clear beyond the distance of 100 yards from the shore on either side; there is generally a slight westerly current in it.

Digitized by Google

Tristomos Harbor, the entrance to which is about ½ mile westward of the castle, is nearly 2 miles long east-northeast and west-southwest, about ¼ mile broad, with depths of from 2 to 5 fathoms, and landlocked. There are several small islands and rocks in the entrance, and the inner island divides it into two narrow channels, in which there appear to be depths of 3½ and 4 fathoms, but neither have been closely examined.

Polemos Bay, on the northern side of the peninsula westward of Kakava Island, affords anchorage for small vessels.

Port St. Stephanos is a small bight on the southeastern coast of Kakava Island, with some islets off the entrance.

St. Elias Island about 1 mile northwestward of the eastern extremity of Kakava Island and 70 yards eastward of the mainland, is about 300 yards in extent and 166 feet high; there is an islet, 72 feet high, at its northern end.

Martinis Bank, 200 yards southward of St. Elias Island, is small, and above water.

Ashilada, about 350 yards northward of St. Elias Island, is about ½ mile long east and west, 600 yards broad, and 279 feet high.

Yali Bay, within St. Elias Island and Ashilada, is surrounded by precipitous rugged mountains covered with low bushes; it affords anchorage for vessels of light draft, but the holding ground is not good and a vessel should moor for a long stay. The entrance northward of Ashilada has a least width of about 80 yards, with a depth of 4¼ fathoms in the fairway; it leads direct to the anchorage, and is better than the channel southward of the island. Keep the southern shore aboard to clear a patch of rocks extending from the northern shore nearly to mid-channel abreast the middle of Ashilada.

Winds.—Land and fresh sea breezes prevail during spring and well into summer; during this period northeast winds are rare, of short duration, and accompanied by excessive heat.

Supplies.—Meat can be procured only during winter. Water is scarce; there are some indifferent springs in Tristomos Harbor. No refreshments can be procured without sending into the interior, to Myra, or to the villages up Andraki River.

Andraki River.—Andraki Point, about 2 miles east-northeastward from the eastern extremity of Ashilada, is the eastern entrance point of a bay extending 1¼ miles northward. Andraki River, the mouth of which is inside the point, is very brackish in summer and has a shoal bar, passable only by boats of very light draft.

Pyrgo Point, 2 miles eastward of Andraki Point, is the eastern extremity of a sandy and shallow bay. There is a ruined castle on the point. A steep gravel beach extends 5 miles east-northeastward from the point, and there is a narrow entrance between its eastern end and the coast of Phineka Promontory into a large brackish lake;

Digitized by Google

in the entrance there is a depth of 3 feet water, and for some distance inside depths of 1½ fathoms.

A river (ancient Limyrus) flows into the head of the lake.

Cape Phineka is the southern extremity of a bold promontory, about 4,800 feet high; the mountains farther inland are covered with snow.

Yeronda Creek, on the eastern side of the promontory, is an inlet which extends ¾ mile northward, with a width ½ mile, and depths of from 29 to 7 fathoms; it is open to southerly winds. The eastern side of the inlet is a bold projection extending about 1 mile southward, and close southeastward of its extremity is an islet 34 feet high, with a channel between for small craft. On the east coast and about 1¾ miles northward of the extremity of this projection is the old castle of Phineka, near which two rivers flow into the sea.

Anchorage.—The silt from these rivers has made a convenient bank for summer anchorage southeastward of the castle. Anchor in a depth of 7 fathoms, which is sufficiently near the rivers for the purpose of obtaining wood and water, and leaves room to way if the wind should freshen from seaward.

Water.—The eastern of the two rivers near the castle is the better for watering, and, when there is no surf, boats can pass over the bar with their casks full; the water is good.

Phineka Bay lies between Phineka Promontory and Cape Khelidonia. Its northern shore trends east-northeastward 2½ miles from Phineka Castle, and then east-southeastward 9 miles to the north entrance point of a small bay, and is low and sandy to near the point, where there are white-rock cliffs which show like a castle. The entrance to the small bay is 1¾ miles wide northwest and southeast, and the bay extends 1½ miles northeastward, with general depths of from 20 to 7 fathoms. Anchorage can be obtained in the southern part, sheltered, excepting from the westward. The depths at the anchorage are much less than shown on the chart.

At a point southeastward of the castle, where a depth of 7 fathoms is shown, only 4¼ to 4¾ fathoms has been found.

Cape Khelidonia.—The coast from the southern point of the small bay just mentioned trends southward 2 miles to Cape Khelidonia, which is the extremity of a mountainous promontory, and steep-to.

Khelidonia Isles.—About ½ mile southward of Cape Khelidonia, with deep water between, is an island 600 yards in extent, and 400 yards farther southward is an island about 1 mile long north and south, with a greatest breadth of 800 yards, and 480 feet high; an islet lies close off its northeastern side. South Islet lies 400 yards southward and Southeast Islet 1 mile east-southeastward of the southern point of the last-mentioned island. There are some creeks,

Digitized by Google

available for small craft, in the large island. The islands are steep-to, except Southeast Islet, from which a reef extends nearly 200 yards eastward. The passages between the islands and between them and the cape are navigable.

Current.—The current off Cape Khelidonia generally sets westward at a rate of from 1 to 2 miles an hour, but it appears to be very uncertain. It has been observed to set southeastward at the rate of nearly 3 miles an hour, and on the following day at the rate of about 1 mile, although there had been no change in the wind, weather, or swell for several preceding days.

Gulf of Adalia.—Cape Anamur lies 118 miles eastward of Cape Khelidonia, and the Gulf of Adalia extends 42 miles northward between them.

Winds.—Off the west shore of the Gulf of Adalia, northeastward of Cape Khelidonia, the sea breeze, which is generally a west or southwest wind during summer, becomes a northerly wind. Toward the head of the gulf it shifts to northwest and west, and sometimes to southwest.

The coast from Cape Khelidonia trends northeastward 6 miles, and then northward 1¼ miles to the southern entrance point of Adratchan Bay. It is generally steep-to, but there are a few rocks close to it.

Grambusa Island (ancient Crambusa), 3¾ miles east-northeastward of Cape Khelidonia, is ¾ mile long northwest and southeast, with a greatest breadth of ¼ mile, high and rugged; though a nearly bare rock, there is a good spring of water on it, and it is therefore visited by small coasting vessels. There is anchorage between the island and the main in 28 fathoms, coarse ground, but the bottom is generally rocky.

There is a natural archway through the island, which can be used by boats, but there is a strong westerly current in it.

Adratchan Bay, the entrance to which is 1 mile wide, is open to the eastward, but affords a little shelter to small vessels in a cove inside the southern point of the bay.

Adratchan Point lies 2½ miles east-northeastward of the northern point of Adratchan Bay, and there is a barren islet close off it. The water in the channel between the point and islet is deep, but it should not be used by sailing vessels, as the current is uncertain.

The coast from Adratchan Point trends northwestward about 2 miles to a T-shaped peninsula of high white cliffs, and there is a cove on each side of the isthmus connecting it to the mainland.

Mount Adratchan, 1 mile southwestward of the peninsula, is about 3,300 feet high.

Port Genovese, on the northern side of the isthmus, extends southward 400 yards, and its width is about the same, the depths being from 18 to 4 fathoms, good holding ground. There are three

Digitized by Google

small rocks above water, close together and steep-to, in the middle of the entrance. The head of the bay is a beach. A northerly wind would send in some swell, and heavy westerly squalls come down from Mount Adratchan. Some water can be procured, and scattered trees on the adjacent hills can be cut.

Chiralu Bay extends northward 1¾ miles from its southern point, which is situated about 1¼ miles northwestward of Port Genovese. On the southwestern shore of the bay is Deliktash village, where are the ruins of the ancient city of Olympus; and Yanar Volcano, on the side of a woody hill, inshore of the northern part, is small, but emits a bright and constant flame that may be seen from some distance.

The coast from the north point of Chiralu Bay trends north-northeastward 4 miles, and is a succession of small bays, with a rivulet of good water in each. The coast is a black crumbly rock, which yields to the action of the sea, and from every point formed of it an irregular reef projects from 200 to 400 yards; the fragments are rounded by the surf, and the beaches are generally covered with them. The coast from the northeastern of the small bays trends northeastward 2¼ miles to a point, and is a sandy beach. Tekrova peninsula is ¾ mile further northeastward.

A small bay immediately northward of Chiralu Bay is encumbered with rocks.

Trianesia, a group of three small, low islands, lie 3½ miles northeastward from the northern point of Chiralu Bay and 1½ miles offshore. There is anchorage around the islands in from 18 to 30 fathoms water; in the eastern island is a cove and small vessels sometimes warp in. A reef extends about 300 yards north-northeastward from the eastern island, and a small patch of rocks lies about the same distance eastward from the cove.

Tekrova (ancient Phaselis) is the ruins of a town on a small peninsula which has on either side the remains of an artificial port. There is anchorage on clean ground abreast of the peninsula.

The land from Tekrova rises gradually to Mount Takhtalu (ancient Solyma), 7,800 feet high, which is situated 5½ miles to the westward.

The coast from Tekrova trends northeastward 4½ miles to Cape Avova and is a gravel beach, through which two rivers, with good water, flow into the sea.

Cape Avova is a bold cliff of white rock rising to a hill 990 feet high, 1 mile southwestward; at its southern point is a creek in which small coasters shelter, and in the middle of the cape is a deep cave, which could be entered by several boats.

Water.—On the northern side of the cape a rivulet of good water flows into a small bay.

Reef.—About 1½ miles north-northwestward from Cape Avova is a large patch of rocks nearly awash, on which the swell generally

Digitized by Google

breaks. Adratchan Point open eastward of Cape Avova 193° leads about 1 mile eastward of the reef.

The coast from Cape Avova trends northward 12 miles to abreast Rashat Isle, and high ranges of mountains run parallel to it from 3 to 4 miles inland, spurs from which descend to the sea. There are some suspicious overfalls about 4½ miles southward of the isle, where shoal water might exist.

Rashat Isle, about ¼ mile in extent and 360 feet high, is separated by a narrow channel from the mainland, and a shoal bank extending off the coast leaves but a small space available for anchorage. The bottom is sandy, there is no room to veer, and the isle is so small that it could hardly break a heavy swell, yet to a vessel embayed in the gulf the shelter here might be valuable. The isle is steep-to on all sides, and a vessel, by hauling close round, might bring up under its lee or perhaps secure to the rocks, providing against the eddy winds from the mountains. Should the wind suddenly change, either passage is clear.

The coast from abreast Rashat Isle trends northeastward 6½ miles, the last 5½ miles being a steep gravel beach; it then turns eastward about 1 mile to Adalia.

Adalia (ancient Olbia) is a little harbor, but the space in it clear of rocks is too small for general use.

The ruins of the south pier above water resemble the walls of a ruined castle, rising to a considerable height; the quays are also in a ruinous condition.

Adalia, population 29,425, is the largest town in the gulf and is the residence of the pasha of the province. It is situated around the harbor and is surrounded by an ancient ditch and a rampart with numerous towers. The country in the vicinity is fertile, extensively cultivated, and well watered. A considerable portion of the inhabitants are Greeks, but the Turkish language is universally spoken.

Supplies.—Water is supplied free from the customhouse quay, and other refreshments can be procured. Vegetables and meat are plentiful, but bread is inferior. Fruit can be procured in season, and game—wild boar, ilex, goats, woodcock, partridge, francolin, snipe, and hares—is plentiful in winter. There is a bazaar, which displays many articles of European manufacture.

Coal.—No coal is kept in stock.

Communication.—There is a telegraphic communication with Smyrna.

Outer Anchorage.—The anchorage off Adalia is unsafe in winter, but in summer it is very good in from 15 to 20 fathoms water.

Light.—A fixed white light is exhibited, at 131 feet above the sea, from a lighthouse situated on the coast about 1,200 yards southeastward of Adalia Harbor. Visible 12 miles. (See Light List.)

Digitized by Google

The coast from the lighthouse trends southeastward 3 miles to a point with overhanging cliffs, and a short distance from the lighthouse several streams fall from the cliffs into the sea; they are used for turning mills, but the water is not suitable for domestic purposes as it contains a calcareous sediment.

The coast from the overhanging cliffs turns eastward, and at a distance of 1¾ miles are the remains of the artificial harbor of Laara, but of the town to which it belonged, ancient Attalia, there are few vestiges.

The coast from Laara trends eastward 26 miles, and then turns east-southeastward 4 miles to Eski Adalia; it is low and sandy, and several rivers flow through into the sea. Of these, the ancient Cestrus and Eurymedon (the modern names have not been ascertained), about 4 and 17 miles, respectively, eastward of Laara, are large, and inside the bars they are deep, but small boats can only enter with difficulty. Low sand hills, in some places bare and in others covered with bushes, stretch along the beach, and a broad irregular plain extends thence to the foot of the mountains.

Reef.—A rocky reef extends about 1½ miles offshore 4 miles eastward of the mouth of the Eurymedon; there may be other rocks outside the reef. A river flows into the sea near the eastern part of the reef, and hills approach its mouth.

Caution.—The low sandy coast between Laara and Eski Adalia must be approached with caution, as it has not been closely examined.

Eski Adalia (ancient Side), as it is erroneously called by the Turks, is situated on a point projecting about ½ mile west-southwestward from the coast line.

The harbors are now filled up, but numerous ruins, particularly an enormous theater, are in good preservation; there is no fresh water, and therefore no inhabitants.

The coast from Eski Adalia trends east-southeastward 16 miles to Kara Burnu and is low and sandy. Several rapid rivers flow through it into the sea. Rocks and shoal water extend about ½ mile off it in places.

Manavgat River (ancient Melas) enters the sea about 6 miles east-southeastward of Eski Adalia. On the bar there is a depth of 3 feet; just within the entrance it is 550 feet wide, and there is a depth of 12 feet, increasing to 21 feet, farther up. On the right bank, about 3 miles from the entrance, is Manavgat Kalessi (castle), and here the river is about 120 feet wide and 13 feet deep. The muddy water from the river extends several miles seaward.

There is a large and noticeable gap in the mountains, through which the river passes.

39148—16——35

Digitized by Google

Kara Burnu is a cliff covered with dark trees; a small island lies close off a small point about ½ mile westward of it, and there are a number of rocks around.

The coast from Kara Burnu trends east-southeastward 16½ miles to Kiloarda Burnu, and is bordered by rocks in places; the rocks extend nearly 1 mile off the coast about 7 miles from Kara Burnu. The coast should therefore be approached with caution. There is occasional anchorage for coasters.

Ptolemais.—About 5 miles from Kara Burnu a point projects about ½ mile southwestward from the coast line; it is the supposed site of the ancient Ptolemais, but the long pier that formed its harbor is now sunken. Off the point there are patches of rocks, and the soundings are irregular.

Kiloarda Burnu is the southwest point of a promontory which projects about 1 mile southward from the coast line. The promontory is about ½ mile broad and 780 feet high; its cliffs, of a dark reddish color, on the west and south sides are 600 and 500 feet high, respectively. A high ridge of rocks extends about ¼ mile southwestward from the cape.

Light.—A flashing white light is exhibited, at 393 feet above the sea, from a tower on the southwestern side of the old fort at Kiloarda Burnu. Visible 20 miles. (See Light List.)

Alaya Anchorage.—There is tolerably good anchorage in the road eastward of the promontory, with the Octagon Tower, on the northern side of the town, bearing 270°, distant 600 yards, in 6 fathoms water. Small vessels go close in to the landing place, which is a rough stony beach immediately southward of the above tower. As the bottom in the road is loose sand on which, as holding ground, little reliance can be placed, and a heavy surf rolls in during and after southerly winds, the anchorage must be used with caution, especially in winter.

Alaya (ancient Coracesium).—The town of Alaya stands on the eastern side of the promontory, which is a rocky steep declivity, the houses being built in terraces one above another. The pasha of the province resides here. The population of the town is about 1,500. There is telegraphic communication with Konia. Wood (pine and walnut) and licorice are largely exported.

Alaya has neither harbor nor pier.

Supplies.—Small bullocks and vegetables can be obtained here.

The coast from Alaya trends southeastward 21 miles to Silinti, and then in the same direction 14½ miles to Nephelis, whence it turns east-southeastward 15½ miles to Cape Anamur. It is generally high and bold, having but few bays and no harbors. A peak, 4,800 feet high, situated 8½ miles eastward of Kiloarda Burnu and 4 miles inland, is a good mark.

Digitized by Google

Hamaxia.—The ruins of this ancient town are situated on a promontory which extends about 200 yards southward from the coast line, 17 miles southeastward of Alaya. The cliffs of the promontory are 138 feet high.

Silinti (ancient Trajanopolis), the ruins of which are situated near the mouth of a shallow stream 4 miles southeastward of Hamaxia, contains the mausoleum of the Emperor Trajan, a very large structure surrounded by 110 columns.

The cliffs southward of the river mouth are 585 feet high.

Antiochia (probably the ancient Antiochia of Cragus), 9 miles southeastward of Silinti, are extensive ruins.

Melisse is a small bight 6½ miles westward of Cape Anamur. An iron pier extends from its shore, and three red buoys are moored off it.

Cape Anamur (ancient Anemurium) is bold, steep-to, and the western bluff is 500 feet high; vestiges of the old city cover the cape and vicinity.

Light.—A group flashing white light is exhibited, at 223 feet above the sea, from a white masonry tower, 33 feet high, on the southern extremity of Cape Anamur. Visible 15 miles. (See Light List.)

Anchorage.—There is good anchorage for coasters on the eastern side of the cape during the fresh westerly sea breeze.

Supplies.—On the adjoining plain are several villages whence cattle might be procured.

The coast from Cape Anamur trends northeastward about 6 miles, and is a sandy beach, to a point on which is a village and the large old Anamur Castle. Water can be obtained in the mouth of Direk Ondessi River, ½ mile westward of the castle. The coast then turns eastward and southeastward 9½ miles to Kizliman Burnu; it becomes higher, and from about 4 miles from the castle is much indented with several little bays, which might afford shelter to small vessels.

Softa Kalessi is situated on a hill, 660 feet high, about 6 miles eastward from Anamur Castle, and on the coast below it are the ruins of a pier and town, probably the ancient Arsinoe.

Kizliman Burnu is the extremity of a peninsula, projecting about 1 mile southward, 600 yards broad, 500 feet high, and bold-to.

The coast from Kizliman Burnu trends north-northeastward about 4 miles, and then turns eastward 8¼ miles to Port Melania; it appears to be high and fairly steep-to, but rocks and shoal water extend nearly ½ mile off it for about 4½ miles eastward from 4 miles northeastward of the cape.

A bare rock lies 4½ miles 51° from Kizliman Burnu and 1¼ miles offshore; it is small and 50 feet high.

Digitized by Google

Port Melania is small and deserted; it is open to south and southeast winds, but coasting vessels can obtain shelter in it.

The coast from Port Melania trends east-northeastward 2 miles to Port Chelindreh, and appears to be high and fairly steep-to.

Port Chelindreh (ancient Celenderis) is a very small but secure harbor, with from 2½ to 1 fathom water. There are a ruined fortress and a large tower on the point on its eastern side and a few miserable huts on shore near the head.

The coast.—A point lies nearly 4 miles east-southeastward from Port Chelindreh, and the coast between forms two large bays and some smaller ones.

Two islets, one of which is 114 feet high, lie 1 mile southeastward of Port Chelindreh. A bare rock, 96 feet high, lies 1 mile southwestward of the point just mentioned.

The coast between the point southeastward of Port Chelindreh and Cape Cavaliere, 13 miles eastward, is divided into two large bays by a promontory; it contains several deep creeks and inlets, which could be entered by vessels of moderate size, but none afford shelter from southwesters.

Papadula Islands, two in number, lie ½ mile southwestward of the promontory just mentioned. The islands, which are separated by a narrow, rocky channel, extend ½ mile northwest and southeast; the southern and larger is 600 yards broad in its south part and 342 feet high.

The southeast point of the promontory is probably the ancient Aphrodisias.

Cape Cavaliere is the southern extremity of a peninsula, about 1¼ miles in extent and 738 feet high, connected to the main by a low and narrow isthmus, which forms a small bay on either side, the one on the western side being shoal and foul.

Port Cavaliere, the bay on the eastern side of the isthmus, is a good anchorage, which is much frequented by vessels beating to the westward. The anchorage is divided into two parts by Cavaliere Island, which is 750 yards long east and west, and narrow. A good position is in the northern part, with the northeast point of the island bearing 162°, distant 400 yards, in about 18 fathoms water.

The coast from Port Cavaliere trends northeastward 14 miles, and is high and steep; it then turns southeastward and southward 7 miles to Bagasse, and is low sand hills.

Provencal Island, 3½ miles northeastward of Cavaliere Island, called Manavat by the Turks, but better known by the name of Provencal, is 1¾ miles long northeast and southwest, 1,400 yards broad, and 900 feet high near the southwestern end. On the northwestern side are an immense number of ruins. The channel between the island and the main, 1¼ miles broad, is a good road, with shelter

Digitized by Google

in all weathers and a ready egress with all winds. A good position for anchorage is with the extremities of the island bearing 183° and 80°, in 17 fathoms, mud bottom; nearer the island there are some patches of rough ground.

Rock.—There is a rock, awash, ½ mile west-southwestward of the southwest point of the island; it is nearly 200 yards long northeast and southwest and 100 yards broad, with deep water less than 200 yards around.

Aghaliman.—On the northwestern shore of the deep bight which extends 8½ miles northeastward of Provencal Island there are several small bays; of these Aghaliman, on the northwestern side of Aghaliman Burnu, the extremity of a peninsula which juts out about 1,400 yards from the coast line, is a good harbor for coasters, and large vessels could obtain some shelter in the bays on each side of the little peninsula. A small ruined fort stands on the western shore of the harbor, and there is a Turkish village inside the walls, which is occupied only during winter, the inhabitants retiring in summer to the mountains to avoid the heat and cultivate their farms; the fort is conspicuous. Aghaliman is the scala for Selefkeh Town, which is situated about 9 miles northeastward by the road.

Shoals.—Within about 1¾ miles of the coast trending southeastward and southward to Bagasse are numerous overfalls and shifting banks, which should not be approached.

Bagasse (Lissan el Kahbeh of the Turks) (possibly the ancient Zephyrium Promontory), is the extremity of a long projecting point of low sand, off which an irregular shoal spit extends nearly 1 mile to the southward, and ¾ mile farther southward is a sand patch, with 4½ fathoms water. The southern end of Provencal Island bearing 273° leads about 1½ miles southward of the patch.

Light.—Two fixed white lights are exhibited, from a mast surmounting a small white house, about 1,400 yards northeastward of the extremity of Bagasse. Visible 10 miles. The lighthouse is not very noticeable. (See Light List.)

Caution.—Bagasse has not been examined since the survey in 1812, and it is probable that the spit, together with the adjacent shoals, may be extending. It is reported that the coast here is laid down on the chart 2 miles too far to the northward; also that at 6½ miles from the spit there is no bottom at 100 fathoms, although the water may be discolored. Great caution must therefore be exercised when in this locality.

The coast from Bagasse trends northeastward 10 miles to a point where the Ghiuk Suyu flows into the sea; it is low sand hills covered with shrubs, and there appears to be deep water at the distance of about ½ mile from it.

Digitized by Google

Ghiuk Suyu (ancient *Calycadnus*) issues from its mouth with a strong current, which sets eastward 2 miles and then turns sharply southwestward, in which direction its muddy course is marked by a curved and well-defined line; at its entrance the river is 200 feet wide, and inside the bar there is a depth of 18 feet. This river was formerly navigable to what is now Selefkeh Town (ancient *Seleucia*, but at present its mouth is closed by a shallow bar.

The points of the beach which form the river's mouth are steep-to, and there are no off-lying banks, so it can be closely approached.

Anchorage can be obtained about ½ mile southward of the mouth of Ghiuk Suyu in 15 fathoms water.

The coast from the mouth of Ghiuk Suyu trends northward, and is low sand hills, 5 miles to Pershendi, where there are extensive ruins. Thence it trends northeastward 11 miles to Lamas, and is indented by many creeks and inlets, but there are no harbors or sheltered roads, though the numerous ruins and towers attest its ancient population and importance.

Korghos Castles.—At Korghos, 3 miles northeastward of Pershendi, there are two castles; the northern and larger is on the main and is much ruined, the other nearly covers a small island on which it is built; they are very conspicuous.

Ayash, the site of the ancient island and important city of Eleusa, 1¾ miles northeastward of the northern Korghos Castle, is now a collection of huts, and the coast in the vicinity presents a succession of ruins, among which the aqueduct, 6 miles long, extending from Eleusa to Lamas River is most remarkable.

Lamas River is very good for watering, as the boats are able to enter it and return over the bar when loaded. Lamas, a small village, is on the right bank at the entrance.

The coast from Lamas River trends northeastward 17 miles to Mezetlu, and thence in the same direction 4 miles to Mersina. Northeastward of the river the coast rises in a gradual slope to a range of mountains from 5 to 8 miles inland; and several rivers, from which good water can be obtained, flow through it into the sea.

Mezetlu (ancient Soli or Pompeiopolis) is situated on a small projection of the coast. Numerous vestiges of the ancient city still remain, including the masonry piers of the ancient port, which is now filled with sand.

Mersina—Light.—A fixed and flashing white light is exhibited, at 53 feet above high water, from a white stone tower situated on a point about 1 mile southwestward of the town. Visible 12 miles. (See Light List.)

Anchorage.—The port of Mersina is only an open roadstead, southeastward of the coast between the lighthouse and the northeastern part of the town; shoal water of less than 3 fathoms extends

Digitized by Google

from ¼ to ½ mile off this coast. The best anchorage is about 1 mile offshore in 6 fathoms water, stiff mud bottom, with the lighthouse bearing about 270°, distant 1¼ miles, and the dome of the Greek Church about 310°.

The anchorage is open to winds between southwest and east-southeast, but the holding ground is good, and vessels with good anchors and gear and sufficient cable out should be safe in any weather.

A considerable number of lighters, which are moored ½ mile offshore, break adrift and go ashore in the winter gales.

The sea is enough to be unpleasant for boats during onshore winds, and also during the southwesterly sea breeze in summer.

Landmarks.—The most prominent object in Mersina, and the first to be seen in approaching from seaward, is the group of buildings, with four-story godown and tall chimney, which constitute the works of the Whithall Cotton Seed Oil Factory. These buildings are located 2 miles 43° from the lighthouse.

Shoals.—A small rocky patch, with 4¼ fathoms water, lies with the Greek Church dome bearing 322°, distant 1,900 yards, and a similar patch, with 5 fathoms water, lies with the dome bearing 327°, distant 1.35 miles.

The town.—Mersina, for a Turkish town, is well built, most of the houses being of stone, and the main streets are fairly broad and paved with uneven cobbles. It is the seat of the Mutaserif of the Sanjak of Mersina, whose offices are in the main street, which runs parallel to the coast. The most noticeable building is the Greek Church, built of stones from Pompeiopolis; it has a gray dome. The population of the town was estimated to be 22,000 in 1905; there is a European colony of about 200, all of whom are engaged in commercial pursuits, the British colony numbering 21 in 1914. There are a large number of Greeks, mostly Cypriots, and it is said that the Christians outnumber the Moslems, but any definite statistics of population are difficult to obtain.

There are four Christian Churches, a Roman Catholic, a Greek Orthodox, a Syrian Catholic, and an American Mission Church in the town.

The country around the town is thickly inhabited and cultivated. There are several villages inland, and in front of one, situated 400 yards northward of the lighthouse, is a large barrack. A group of buildings, with a high chimney, the Whithall Cotton Seed Oil Factory, situated 2 miles northeastward of the lighthouse, is conspicuous.

Most of the foreign consulates are situated on the sea front, or in the main street, their high flagstaffs being visible from the anchorage.

Digitized by Google

Trade.—By far the greatest part of the trade of Mersina is in the export of cotton, cottonseed oil and cake, which are exported to Italy, Spain, Germany, and a little to England. Grain is the other principal export; about 10,000 tons of oats are sent annually to England, but most of the wheat and barley go to Turkey and Syria. Sesame seed, yellow berries for dyes, and vegetable gum are also exported. Cattle, sheep, and goats are exported to Egypt in winter.

Some 25,000 tons of coal, Welsh and briquets, are imported annually, the remaining imports being general cargo.

The appliances for working cargoes are more or less primitive.

Landing piers.—There are no accostable quays of any kind, except for the smallest coasting sailing vessels, which can lie alongside the piers.

There are five landing piers, numbered from the eastward:

No. 1 railroad pier is 460 feet long and extends 400 feet beyond the water line, it is from 35 to 20 feet broad, 13 feet above the sea, and there is a depth of 10 feet at the end, whence it shoals gradually to the shore. There are two lines of rails on the pier, and two traveling steam cranes, one of 4½ tons, and the other of 3 tons, for working on the outer part of the pier beyond the trolley system.

No. 2 pier is 190 feet long, 15 feet wide, and there is a depth of 5 feet alongside it to 60 feet from the shore.

No. 3 customs pier is the principal landing place, and the offices of the captain of the port and of the health officer are here; it is 240 feet long; the portion outside the landing steps is 40 feet and the inner portion 20 feet broad; the deck is 15 feet above the sea, and the depth is 8 feet at the end, 5½ feet at the landing steps, whence it shoals to the shore. On the pier a light tramroad running to a store in the square, one 1-ton fixed hand crane, and 1 half-ton traveling steam crane.

No. 4 pier is 120 feet long, 12 feet broad, and 12 feet above the sea; there is a depth of 6 feet at the outer end, and 4½ feet at the steps. It belongs to a Russian shipping company.

No. 5 pier is a light iron trestle pier, similar to No. 4 pier, except that there are no landing steps. It is in bad condition.

Tugs and lighters.—There are five small tugs, and 47 lighters, of from 15 to 50 tons, the majority being of about 30 tons capacity. The lighters are towed between vessels in the anchorage and the landing piers, where they are loaded or discharged. During the summer sea breeze there is an inconvenient little swell at the piers.

Coal.—About 1,000 tons of coal and patent fuel are said to be kept in stock, but little is imported at a time, and the stock is often exhausted.

Supplies.—Meat, vegetables, and bread are plentiful. Good water is supplied in casks brought in small boats. Water is led into

Digitized by Google

the town, through underground pipes, from the river near the lighthouse, but it is not good; there is a fountain near the port office. There are two ice factories in the town.

Communication.—There is a Turkish post and telegraph office (the latter being open all night) situated on the shore on the east side of No. 2 pier; there are also French, German, Austrian, and Russian post offices.

Mersina is a régular port of call for all the steamers of different nationalities employed in the coasting trade of Asis Minor and Syria.

Mersina is the terminus of the Mersina, Tarsus, and Adana Railroad. Tarsus is situated 17 miles and Adana 36 miles east-northeastward of Mersina.

Climate.—The summer is hot and damp, and mosquitoes are very troublesome; at this season there is a good deal of malarial fever; then such Europeans as can get away move to Guezni, a hill station about 5 hours distant.

The coast from Mersina trends eastward 3 miles to a point on which is Karadavar village; it is low sand hills. About 1 mile north-northeastward of the village is a large tree which is conspicuous from the approach to Mersina Anchorage.

The coast from Karadavar trends eastward and northeastward 2 miles to Kazalu, and is low. About 7 miles north-northeastward of Kazalu is a hill, 1,200 feet high which makes as an island from the southwestward. From Kazalu the coast turns eastward and southeastward 5¾ miles to the mouth of Tersus Chai and is sand hills.

Tersus Chai (ancient Cydnus) flows through Tarsus town, about 12 miles north-northeastward; it is 160 feet wide at its entrance and 12 feet deep.

Syhun Chai (ancient Sarus) flows into the sea about 2 miles south-southeastward of the mouth of Tersus Chai; it is nearly 300 feet wide at its entrance, and has also a depth of 12 feet. A shoal spit projects about 1 mile off the sand head which separates the rivers, and it should not be approached to less than 12 fathoms.

Turtle.—Along the beach, between Mersina and the mouths of these rivers numbers of fine turtle are found; in June they go in pairs on the surface of the water, in which position they can be harpooned with ease. The sea appears also well stocked with fish.

The coast from Syhun Chai trends east-southeastward 25 miles, and then turns southward ½ mile to Karadash Burnu; it is a beach rising to high sand hills, with a sandy plain extending some miles inland, but ½ mile from the burnu it becomes cliffy. The plain is over a considerable extent a mere desert, some parts being inundated with water, while others are sand hills with a few scattered bushes.

Digitized by Google

One of the large inundations or lakes communicates with the sea 1.3 miles northwestward of Karadash Burnu; it is salt, about 12 miles in length northeast and southwest, about 3 feet deep, and is surrounded by barren sands; its shores are covered with swans, pelicans, storks, etc., and it contains turtle and fish.

Karadash Burnu is a low white cliff; the ruins of the ancient town and citadel of Megarsus, within the burnu, are conspicuous. Shoal water of 3 fathoms and less extends about 250 yards from the burnu, and 1 mile 259° from it is a rocky patch with 4¼ fathoms water and from 5½ to 8 fathoms around; the water otherwise shoals gradually to the shore.

Light.—A fixed white light is exhibited, at 131 feet above the sea, from a white iron framework tower, with an attached white house, the roof of which is red on the extremity of Karadash Burnu. Visible 12 miles. (See Light List.)

The coast is continued eastward in Chapter XIII.

Digitized by Google

CHAPTER XII.

CYPRUS—WEST AND SOUTH COASTS, CAPE ARNAUTI TO CAPE ANDREAS; NORTH COAST, CAPE ARNAUTI TO CAPE ANDREAS.

(WEST AND SOUTH COASTS.)

Cape Arnauti (ancient Acamas Promontory) the northwestern extremity of Cyprus, is a sharp low headland and the commencement of a range of moderate height which extends south-southeastward through the island. The cape rises to a double peak, 690 feet high, about 1 mile to the southward; its western side is very steep, but the eastern side is thickly wooded and slopes greadually to the beach.

A ledge of sunken rocks extends ½ mile north-northwestward from the cape, and on its outer end is Mazaki Islet; a ridge of foul ground with from 2 to 3 fathoms water, and deep water close-to, extends 1 mile northward from the islet.

Caution.—The cape should not be approached within 2 miles.

The coast from Cape Arnauti trends southwestward 1¼ miles, and then turns southward and south-southeastward 8 miles to Lara Point; it is high, cliffy, precipitous, and for about 5 miles from the cape is skirted by ledges of sandstone rocks nearly awash.

Koppo Islet, 4½ miles southward of Cape Arnauti, and close to the shore, is small, and 600 yards southwestward of it is an islet or rock; the ground off them is rocky and uneven.

The coast between a point ¾ mile south-southeastward of Koppo Islet and Lara Point forms a bight with several small sandy creeks, which in winter are outlets for the torrents from the adjacent hills. Lara Point projects ½ mile from the coast line, and its western side is cliffy. Boats occasionally shelter on its northern and southern sides.

The coast between Lara Point and Cape Drepanum, 2¾ miles to the southward, forms a bight in which are several sandy bays, open to seaward.

Cape Drepanum is low and flat, with several rocks, islets, and sunken ledges close around; St. Yeorgiou Island, close off it, is small and 100 feet high, with a flat top. There is a chapel in ruins on the island.

The coast from Cape Drepanum trends south-southeastward 10 miles to Paphos Point, and is bordered with sunken rocks extending off nearly ¾ mile in places. Orphourous Islet lies about 600 yards

Digitized by Google

southwestward of a small point 7¾ miles from Cape Drepanum, and there are several sunken rocks between it and the point.

The sea breaks almost constantly on the reefs and ledges of rocks off the coast from Cape Arnauti to Paphos Point.

Paphos Point is the extremity of a low peninsula which projects about ½ mile southwestward from the coast line.

Light.—A fixed white light is shown, at 120 feet above high water, from a white stone tower with a red dome, 65 feet high, situated 700 yards northward of the point. Visible 17 miles. (See Light List.)

Port Paphos lies on the southern side of the peninsula, and within two moles which extend from it, but it is encumbered with sand; there are from 4 to 8 feet water in the entrance, and from 10 to 12 feet over a small area inside, where coasting vessels of light draft, with local knowledge, take shelter, except in southeast gales, which send in a considerable swell.

There is a fort, which is in a state of ruin, on the western mole of the port.

There is a small iron pier, with 5 feet water alongside its head, in the harbor.

Ktima town, about 1 mile northward of the harbor, is the capital of Paphos district, the headquarters of the silk industry. Its population, including that of Paphos, is about 3,435. There is a hospital at Paphos supported by Government.

Supplies.—Fresh provisions can be obtained, and water is supplied free from a fountain near the pier. There is no coal.

Communication.—There is telegraphic communication.

Shoal.—A patch with 3 fathoms water lies southward of the port, 1 mile 158° from the lighthouse. Ktima Minaret in range with the belfry on a conspicuous building eastward of Paphos leads eastward of the shoal and westward of Moulia Rocks, in not less than 26 feet water.

The port should be approached with caution.

The coast from Port Paphos trends east-southeastward 16 miles to Cape Aspro, and is fronted by a low sandy and stony beach to 5 miles from the cape, whence the coast is high and rugged, and several rocks and sunken ledges extend off ¼ mile.

On the shore northward of Moulia Rocks is a large storehouse, used for the collection of the produce of the adjacent plains for exportation.

Moulia Rocks, 2½ miles southeastward from Paphos Point Lighthouse and ½ mile offshore, are two in number, both being low and black; and a ledge of sunken rocks, on which the sea constantly breaks, extends about ½ mile west-southwestward from them. There is a depth of 2 fathoms between the rocks and the land to the northward.

Digitized by Google

Anchorage.—Should it be necessary to anchor on this coast, the anchorage east-southeastward of Moulia Rocks is the best; it is used by vessels that can not enter Port Paphos. Here there is anchorage in from 6 to 11 fathoms during summer, tolerably sheltered from westerly winds; southwesterly winds are then rare.

Water.—A small supply of water may be obtained by digging a well near the beach.

Cape Aspro is the southern and middle part of a line of cliffs, which extends about 2 miles east and west, and the land is 956 feet high 1 mile northward of it. The cape shows three cliffs, each cliff being a high bluff headland.

Shoal water extends nearly ¾ mile off the cape.

Episkopi Bay.—The coast from Cape Aspro trends east-northeastward 8½ miles, and then turns south-southeastward 6½ miles to Cape Zevgari and forms Episkopi Bay. The northern shore of the bay is a succession of small sandy bays with high white cliffs between; the eastern shore is a low sandy beach until about 1½ miles northward of Cape Zevgari, when it gradually rises to a moderate height ½ mile from the cape, and then again becomes low.

Pissouri Bay and Evdhimou Bay, two of the above-mentioned sandy bays, lie about 1 and 3½ miles, respectively, eastward of Cape Aspro. Storehouses for carob (locust) beans are built on the beach in these bays, and during fine weather both steamers and native craft anchor off them to load.

The anchorage, in 10 fathoms, from 1 to 1½ miles offshore, is very much exposed, and the swell, which continually rolls in, renders it both unsafe and uncomfortable. Neither supplies nor water can be obtained.

Episkopi village is about 1 mile inland 6 miles northward of Cape Zevgari; Kouris River, a large stream, passes eastward of it, and enters the sea 5 miles north-northwestward of the cape. Nearly 1½ miles eastward of Episkopi is Kolissi (Kolossi) village and tower. The tower was built by the Knights Templars during their occupation of this part of the island, and is conspicuous from seaward.

Akrotiri Peninsula projects about 5 miles southward from the general coast line and is the southernmost part of Cyprus. It is about 4 miles broad, and its highest part, 188 feet, is on the south coast, 2 miles eastward of Cape Zevgari; it gradually becomes low to the northward. In the middle of the peninsula is a large salt lake with depths of about 3 feet. From a distance westward the peninsula appears an island.

Cape Zevgari, the southwestern extremity of Akrotiri Peninsula, is about 20 feet high; there are several low rocks above water off it, and foul ground extends nearly 1 mile westward and ½ mile southward.

Digitized by Google

The coast from Cape Zevgari trends eastward 5 miles to Cape Gata; it is generally steep-to. Vatha is a rock above water, with sunken rocks around, situated in and close to the shore of a bight 2 miles eastward of Cape Zevgari.

Cape Gata is a high and bold cliff; shoal water of from 3 to 5¼ fathoms extends 1,300 yards southeastward, and foul ground ¼ mile eastward, from it. In thick weather three white patches may be seen before the lighthouse is visible.

Light. A fixed and flashing white light is shown, at 190 feet above high water, from white stone tower on the summit, situated 1,400 yards westward of Cape Gata. Visible 15 miles. (See Light List.)

Akrotiri Bay.—The coast from Cape Gata trends northwestward 2¼ miles, and then northward 4½ miles to Limasol, whence it trends east-northeastward and eastward 12 miles to Cape Dolos, forming Akrotiri Bay, in which there is anchorage in moderate depths from ½ to 1 mile offshore, and sheltered from westerly winds, but open southeastward. The shore to about 5 miles east-northeastward of Limasol is an almost unbroken sand and shingle beach, with occasional patches of low rocks close to its northeastern part.

Limasol—Light.—A fixed red light is exhibited from a red mast, 18 feet high, on the outer end of the iron pier.

Shoal water of less than 3 fathoms extends 800 yards offshore ¾ mile southwestward of the pier and from 200 to 400 yards off the town.

Anchorage.—There is anchorage off the town, in from 7 to 12 fathoms, good holding ground, and although open to the southward and eastward vessels with good anchors and chains do not drag in gales. In winter it is usual to anchor in about 12 fathoms. Northeasterly gales are prevalent from October to April.

The town extends about 1 mile along the beach; it is clean, with good but narrow streets. The cathedral, with a dome, and a large double-storied house, with a tower, close eastward of it are conspicuous from seaward. At ¼ mile westward of the iron pier is a small house, with a red roof; close westward of the town is a tile factory with two chimneys; and 1½ miles northeastward of the pier are gypsum factory buildings, with red roofs and a high chimney.

A range of wedge-like hills, covered with bushes, lies at the back of the town, and a stream flows through the town in winter, but it dries in summer. The town is administered by a commissioner, assisted by a municipal council, and there is a force of military police. The population is about 10,302.

Piers.—There is an iron pier, 302 yards long, with a T head, and a depth of 15 feet at its end, where small steamers lie and coal. Trolleys are run on rails from the pierhead to the customhouse; the

Digitized by Google

pier is provided with two cranes, one fixed at its extremity and the other traveling on trolley lines.

An iron trestle pier extending from the quarantine station, about 200 yards westward of the preceding, is 70 yards long, and has a vertical ladder at its end. An iron pier, 100 yards long, was constructed in 1914 about 200 yards northeastward of the long iron pier. A small private pier, belonging to the gypsum factory, extends from the eastern end of the town.

The teredo is very destructive here.

Buoys.—Four red buoys off the end of the iron pier, two on either side, are available for mooring purposes for vessels alongside the pier; the two outer buoys are in 3 fathoms and the two inner ones in 1½ fathoms water.

Landing.—The proper landing place is at the iron pier, where there are steps, but during strong northeasterly and southeasterly gales it is impossible to land, owing to the surf; as far as has been ascertained there is sufficient water for laden boats to land anywhere on the coast in the vicinity.

The average number of days that cargo can not be worked in the roads on account of weather is: In January, 8½; February, 6¼; March, 4¾; April, 3; May, 1½; June, July, and August, each $\frac{1}{10}$; September, ¾; October, 6; November, 6; and December, 7¾.

Trade.—The principal trade is wine to Egypt, and carobs (locust beans) to Europe.

Supplies.—Provisions are plentiful. Water is taken through pipes to the end of the iron pier; it is obtained from a reservoir formed by connecting a system of wells, and is good and abundant. When water is wanted apply to the pier master. Water is laid on through the town by iron pipes. There is no coal.

Communication.—Limasol has communication by telegraph with the six principal towns in the island, and, in summer only, with Platres and Troodos. There are motor-bus services daily between Nicosia, Limasol, and Larnaka.

Health.—Fever of a mild type exists in the low-lying country round the town, but climatic diseases are uncommon. There is a hospital in the town supported by Government.

The coast.—The ruins of ancient Amathus, once famous for its metals, are situated on the coast about 5 miles east-northeastward of Limasol; the site of the town, with its wall and harbor, is clearly marked.

The coast from Amathus trends eastward 5½ miles and then east-northeastward 1 mile to Cape Dolos. There are many rocks within about ¼ mile of the shore in the vicinity of Amathus and for about 3 miles westward of Cape Dolos.

Digitized by Google

A bay extends nearly 1 mile northward between Cape Dolos and a point 2½ miles east-northeastward of it.

Zyyi, 1 mile northeastward of the point just mentioned, is a place where large quantities of carobs (locust beans) are shipped. There is an iron pier 410 feet long, with 5½ feet water alongside.

A mountainous range approaches the sea in this locality, and Mount Chionia or Machaira (Makhæra), its summit, 14 miles north-northwestward from Zyyi, is 4,674 feet high.

The coast from Zyyi trends east-northeastward 14¼ miles to Cape Kiti. Between Cape Dolos and Cape Kiti there are many outlying rocks, but none extend more than about ¼ mile from the shore. The 5-fathom curve is from 600 to 1,000 yards offshore, but for 1½ miles westward of Cape Kiti it is 1 mile from the beach. When navigating along the coast do not shoal the water to less than 15 fathoms.

Petounda Point, 8½ miles east-northeastward of Zyyi, projects a little from the coast line, and has been mistaken for Cape Kiti.

Cape Kiti is low. A square tower, 73 feet above the sea, stands on a slight elevation 1 mile to the northward. Shoal water of less than 5 fathoms extends 1 mile south-southeastward from the lighthouse and ¾ mile eastward from it. The cape should not be approached to less than 15 fathoms.

Light.—A fixed white light is exhibited, at 82 feet above high water, from a white stone tower situated 200 yards northward of the southern extremity of Cape Kiti. Visible 8 miles. (See Light List.)

Larnaka Bay.—The shore of Larnaka Bay from Cape Kiti trends northeastward 3.6 miles to Dades or Kokino Point, and then northward about 3 miles to Larnaka town; it then continues northward 2½ miles, when it gradually turns eastward 11½ miles to Cape Pyla, the eastern point of the bay. The shore from Cape Kiti to Larnaka is a stony and shingly beach, with an extensive plain at the back, on which are three salt lakes that extend, near the shore, from 1¾ miles northward of Cape Kiti to about ¾ mile from the town. A few rocks skirt the beach from the cape to about ½ mile northward of Dades Point.

On the west shore of the northern lake and 1.9 miles northwestward from Dades Point is a conspicuous mosque with a minaret built over a tomb, called Sultana Tekeh, and said by Mohammedans to be where Umm Harâm, the foster-sister of Mohammed, was accidentally killed and buried in the year 649 A. D. The best salt works in Cyprus are on the east shore of this lake.

The shore for 5 miles northward and eastward from Larnaka town is a sandy beach, backed by a slight elevation, on which are several villages; thence eastward to Cape Pyla the shore is rocky, with a few outlying rocks close off it.

Digitized by Google

Larnaka, the principal seaport of Cyprus and chief town of a district containing a population of 29,737 in 1911, is situated 6½ miles from Cape Kiti and about 26 miles southeastward from Nicosia, the capital of the island.

Lights.—A fixed red light is exhibited from a black iron column on the southern end of the sheltering arm at the iron pierhead; and a fixed red light is exhibited from a black iron column on the northern end of the sheltering arm. (See Light List.)

Anchorage.—The anchorage off Larnaka is safe for vessels with good anchors and chains throughout the year, but the short sea and heavy swell that runs into the bay during southeasterly gales, to which it is open, render it very uncomfortable, and the swell during northeast and southwest gales makes landing difficult. South and southeast gales never last long, but always veer to southwest, and if vessels drag it is in a direction parallel to the shore.

During summer the land and sea breezes are tolerably regular; the latter blows along the shore from the southward.

The usual anchorage is eastward of the northern part of the Marina in from 12 to 18 fathoms, mud; in places in less than 10 fathoms water the bottom is hard and bad holding ground. In strong southeasterly winds the sea often breaks in 5 and 6 fathoms water.

Caution.—Anchorage must be avoided southeastward of the southern end of the Marina.

Quarantine anchorage.—Vessels in quarantine anchor off the shore to the northward of the lazaretto.

Directions.—From the westward, pass 1½ miles southward of Cape Kiti, and give the coast from the cape northward to the anchorage a berth of 1 mile.

From the eastward steer direct to the anchorage when southward of Cape Greco.

Mount Stavrovouni, 10 miles westward of Larnaka, is isolated, surmounted by a monastery, and conspicuous from the approach to the anchorage.

The water shoals quickly from 20 fathoms toward the shore, and caution is necessary when anchoring.

The town is in two parts, the principal one, called the Marina or Scala, extends along the beach about 1 mile and is nearly joined to the other part, which is on its northwestern side and a little inland. The Marina consists of warehouses, bazaars, and many houses, and is bounded on the southward by a small redoubt (in ruins) and on the northward by the lazaretto, which is a large establishment. Southward of the lazaretto are the public buildings, consisting of offices, customhouse, warehouses, and the commissioner's house, all with blue-washed fronts, and southwestward of the small iron jetty is a conspicuous minaret.

39148—16——36

Digitized by Google

The Capuchin Convent in Larnaka, which has a dome and tower, is conspicuous from the anchorage approach. Most of the houses both at Larnaka and the Marina, being built of unbaked bricks and scarcely ever whitewashed, present anything but a cheerful appearance. There is a hospital in the town supported by Government. The population in 1911 was 9,262.

Piers.—An iron pier extends 900 feet eastward from the shore 150 yards southward of the lazaretto; a sheltering arm extends 250 feet northward from its outer end, where the depth is 7 feet. Two hand cranes, each capable of lifting 2 tons, work on rails which extend along the pier and are also used by trucks with cargo; an 8-ton crane is fitted on the sheltering arm. There is a flagstaff at the inner end of the pier.

A jetty extends 200 feet from the shore 400 yards northward of the pier just mentioned.

There is a small iron jetty near an old Turkish fort, now a police barrack and prison, in the Marina; the depth at its head is 5½ feet.

Landing.—The landing place is at the iron pier, where there are steps, but landing in winter is sometimes impracticable, and in summer, during the sea breeze, it is very disagreeable; it is dangerous with any swell, as the sea breaks some distance outside the end of the pier in even moderate weather. There is not enough water for a steamboat to go alongside in safety except in absolutely smooth weather. In strong northeast gales it is generally possible to land at the quarantine station. The morning and evening are generally calm in summer, and these are the best times to land.

The average number of days that cargo can not be worked in the roads on account of weather is: in January, 6¼; February, 3¼; March, 2; April, ½; May, ¼; June, July, August, and September, 0; October, ¾; November, 2¾; December, 5.

Supplies.—Beef, poultry, vegetables, fruit, and wine are readily procured on reasonable terms. Water is brought from a distance of 5 miles by an aqueduct, and can be obtained from the end of the pier on application to the harbor master or sent off in bulk in open boats of about 4 tons each; it is good. There are a number of wells in the town, but the water in them is salt or brackish, and bad.

There is no coal available for shipping.

Communication.—There is telegraphic communication with all towns in Cyprus.

There are motor-bus services daily between Nicosia, Larnaka, and Limasol.

Quarantine station.—The quarantine station is on the shore of Larnaka Bay, about 6 miles northeastward of the town.

Cape Pyla is 376 feet high, and there is a ruined round tower on it.

Digitized by Google

The coast from Cape Pyla trends east-northeastward 6½ miles and then east-southeastward 5½ miles to Cape Greco; it is rocky, but there are one or two coves where boats can land.

A remarkable abrupt table cliff, 400 feet high, is situated 1 mile westward of Cape Greco; it appears like an old fortress.

Cape Greco, the southeastern extremity of Cyprus, is a small peninsula, the middle of the northwestern side of which is connected to the mainland by a narrow isthmus; it is low and tapering, but there is deep water about 600 yards off it.

Light.—A flashing white light is exhibited, at 54 feet above high water, from a white stone tower, 50 feet high, on the cape. Visible 13 miles. (See Light List.)

Current.—A current sets westward, past Cape Greco, at the rate of ½ to ¾ knot.

Famagusta Bay.—The shore of Famagusta Bay trends north-northwestward 18 miles from Cape Greco; it then trends northward 6 miles, when it turns northeastward and eastward 6½ miles to Cape Elæa.

A rock with 3 fathoms water lies 4½ miles northward of Cape Greco and ¾ mile offshore. The eastern extremity of Cape Greco bearing 184° leads about 1 mile eastward of it.

Famagusta Harbor.—About 12 miles north-northwestward of Cape Greco and 700 yards eastward of the southern end of the town, is a point of low sandstone, from which a line of flat rocky islets extends ¼ mile north-northwestward; Messanisi (North Islet), the northern one, is 1 foot high.

A line of rocky islets and shoals continues 1.4 miles north-northwestward from Messanisi, leaving a channel between it and the shore, about 900 yards wide, with depths of from 8 to 5 fathoms over a width of 600 yards for 1,700 yards within its northern end, whence the depth decreases to 3 fathoms and less.

The area westward of the islets and shoals extending 600 yards north-northwestward from Messanisi is sheltered from southeasterly gales; in this area, about 200 yards from the shoals and the ancient mole extending westward from Messanisi, there are general depths of from 4½ to 3 fathoms; the holding ground is better farther northward.

Rocks.—At the northern end of the line of shoals extending from Messanisi is a rock with 3½ fathoms water, 200 yards westward of which is a rock with 4¾ fathoms water; a rock with 26 feet water lies nearly 200 yards to the southward of the 3½-fathom rock; and a rock with 3½ fathoms water 400 yards farther southward.

The inner harbor lies eastward of the town and between it and Messanisi, with the islets to the southward. An ancient mole, dry at low water, extends about 450 yards westward from Messanisi, and

Digitized by Google

a mole extends some 75 yards from the town walls toward it, leaving an entrance 150 feet wide to the inner harbor.

The approach to the inner harbor is through a channel about 250 feet wide, dredged to a depth of 26 feet; its axis trends 159°, and leads through the middle of the entrance.

Within the entrance a basin, which extends about 900 feet southeastward with a width of 600 feet, has been dredged to a depth of 24 feet.

A basin 450 feet long and 200 feet wide, with 15 feet water, is on the southeastern side of the southern part of the basin above-mentioned. Northerly winds cause a slight swell in the basins.

Lights.—A fixed white light with red sector is exhibited from a black iron column 35 feet high, situated 450 yards inland on the western shore of the harbor and 1.35 miles 301° from Messanisi. Visible 10 miles.

A fixed red light is exhibited from a black iron column, 25 feet high, on the mole heads on each side of the entrance to the inner harbor.

A fixed white light is exhibited from a mast surmounting a small white hut, 22 feet high, situated on the southeast bastion of the town walls. (See Light List.)

Beacon.—A beacon, 30 feet high, painted black and white in horizontal bands, stands on the west shore of the harbor 450 yards 36° from the outer light column.

Buoys.—A red bellbuoy, surmounted by a globe, is moored in 7 fathoms water about 400 yards northward of the 3½-fathom rock at the northern end of the shoals extending north-northwestward from Messanisi, and with the outer black light column distant 1,900 yards and in line with the beacon.

The northern entrance to the dredged channel leading into the inner harbor is marked by a red can buoy, surmounted by a cage, on its eastern side, and by a black conical buoy, surmounted by a globe, on its western side.

Two mooring buoys are placed on the eastern side of the northern basin in the inner harbor. A small mooring buoy is placed on the northwestern point of the shoal off the iron jetty, and is used for hauling off by local craft.

Anchorage.—Large vessels anchor in about 17 fathoms water, stiff mud, with Messanisi bearing about 254°, distant 1,200 yards; in this locality the bottom in less than 12 fathoms is rock and sand. There is also anchorage in 7 fathoms water in the channel inside the shoals with the outer light column bearing about 277°, distant 1,300 yards, but the shoals give no protection whatever to this position in northeasterly and easterly gales, therefore vessels anchored more than 600 yards from the mole should go to sea during the gale.

Digitized by Google

Small vessels anchor in the sheltered area within 600 yards from the mole in from 3 to 4 fathoms, and also enter the inner harbor.

Quays.—On the southwestern side of the large basin is a quay 900 feet long, with 24 feet water alongside, and an iron jetty 390 feet long, with 15 feet water alongside, continues the quay southeastward. Vessels alongside the quay secure to bollards; a vessel alongside moves but slightly when there is a heavy sea, caused by strong northeasterly winds outside. There is a 12-ton traveling crane on the quay, and a 1-ton crane on the iron jetty end.

The railroad, which extends to Nicosia and Morphou, passes around the southern side of the town and onto the quay.

Winds.—The fine weather of summer usually continues to the middle of October. East-northeasterly winds, which prevail in winter, commence about the beginning of November, and blow hard; they are accompanied by a heavy sea, and the current sometimes sets northward, when vessels at the anchorage lay broadside on and roll considerably. Northerly winds in winter are very cold, and raise a short choppy sea.

Tides.—It is high water, full and change, at Famagusta at 10 h. 0 m.; springs rise 1½ feet.

Pilot.—A pilot can be obtained by making the pilot signal.

Directions.—To enter the channel inside the shoals, approach with the outer light column in range with the black and white beacon, bearing 216°, which leads to the bellbuoy northward of the line of shoals; pass northwestward of the buoy, and bring the mark again in range; when the small white hut on the southeast bastion, from which a light is exhibited, is seen midway between the black light columns on the moleheads, bearing 159°, keep it so, and anchor as above directed, or proceed with the same mark in range between the two buoys marking the entrance to the dredged channel, and through that channel and between the moleheads into the inner harbor.

During strong winds a large vessel will experience difficulty in entering, and securing in, the inner harbor; in summer the best time to enter is from 7 to 9 a. m. or after 5 p. m., when the wind is usually light or it is calm.

At night.—Approach the outer light showing white and bearing 207°, which leads 300 yards northwestward of the bellbuoy, observing that the line separating the white and red sectors of the light, bearing 216°, leads directly over the bellbuoy. When the fixed white light on the southeast bastion is seen midway between the two fixed red lights on the moleheads, bearing 159°, keep this mark in range to the anchorage or into the inner harbor.

The town (ancient Arsinoe), on the western side of the inner harbor, is inclosed by massive fortress walls, with a perimeter of about 1.6 miles, on the outer sides of which is a ditch 80 feet broad

Digitized by Google

and 45 feet deep. Openings have been made in these walls, in addition to the old gates, to facilitate communication between the town and the harbor. The town was in a flourishing condition under the Venetians, but after being taken by the Turks in 1571 it began to decay, and it was ruined by an earthquake in 1735. The cathedral, now used as a mosque, has a minaret, and is conspicuous from seaward. There is a hospital in the town supported by Government. The Christian people, with their industries, as well as the Government offices, are situated in Varosha village, about 1 mile southward of the town.

The population of Famagusta was 5,327 in 1911.

Coal.—About 1,000 tons of coal are imported in the autumn annually for the use of the Government railroads; the stock varies. About 1,200 tons of coal are imported annually by private firms, and there are usually some 300 tons in stock.

Supplies.—Meat, vegetables, and bread are plentiful. Water is supplied from a hose at the quay on application to the harbor master; it is obtained from a well, and is said to be good, being used for drinking on shore; there is none other.

Salamis.—About 3 miles northward of Famagusta is the ancient port of Salamis, now a shallow indentation, with the ruins of the town in the vicinity.

There is open anchorage about 1.2 miles eastward of the shore of the port with the northern black light column of Famagusta bearing 185°, distant 2 miles, in 13 fathoms water, sand and weed.

St. Sergios is about 1½ miles northwestward of Salamis, and there are stores here for cargo.

Bogaz, a small place on the shore 8 miles northward of Salamis, is frequented by coasters..

Gastria Bay, 3½ miles westward of Cape Elæa, is small; it lies between Castroulli Point on the west and Ayios Yoannis Point on the east. It is frequented by vessels to load grain, and there is a trading station, with stores, on the shore. There is a small hill resembling a castle, near Castroulli Point.

Anchor in not less than 10 fathoms nearly 1 mile southward of the trading station, with Cape Elæa bearing 76°; the holding ground is good.

The bay is open between south and east, but is said to be safe. There is sufficient room for a sailing vessel to get under way should strong east winds set in.

Southeasterly winds last generally but a few hours, and veer to southwest.

Gastria village is about 1 mile northward of the head of the bay.

Cape Elæa is cliffy, and for about 1½ miles on each side rocks and foul ground extend off about ¼ mile.

Digitized by Google

The coast from Cape Elæa trends northeastward 30½ miles to Balounopetra Point and is nearly steep-to, except off Khelonæs Point, 22 miles from Cape Elæa, where shoal water extends off about ¼ mile.

Khelonæs Anchorage, where vessels load grain, is indicated by the stores which are situated close to the shore. Anchor in 20 fathoms water with the stores bearing 310°, at such a distance from the shore as to have room to get under way with strong east-northeasterly winds, which prevail during winter.

The anchorage is safe during southwesterly winds. The anchor should have a buoy rope attached so that should it become necessary to get under way during strong easterly winds, the anchor can be slipped after, in a sailing vessel, a hawser from the port quarter has been made fast to the chain to cant her.

It is dangerous for a sailing vessel to get under way during these winds, for when the chain is shortened in the anchor will come home and the vessel will get sternway, and her head will not cant to seaward; vessels are often wrecked in consequence.

A second anchor must be ready and a kedge anchor on the port bow with a hawser to the port quarter, so that should the chain part the kedge may be immediately let go to cant the vessel to seaward.

Sailing vessels in the anchorage in winter should have sufficient ballast to be manageable.

At Khelonæs the fine summer weather usually continues until the middle of October, and east-northeast winds, which blow hard all the winter, usually commence about the beginning of November.

Galounopetra Point.—A black rock just above water lies ¼ mile south-southeastward of Galounopetra Point.

The coast from Galounopetra Point trends north-northeastward 3½ miles to Cape Andreas. Nearly midway and close to the rocky shore is a monastery and a spring of fresh water.

During summer vessels anchor off the coast to load corn.

Cape Andreas is the northeastern point of Cyprus. There are some ruins and tombs on it.

Klides Islet is about 1 mile northeastward of the cape, and there are several rocks above and below water in the passage between.

Light.—An occulting white light is exhibited, at 60 feet above high water, from a white steel tower with a red lantern, 25 feet high, on Klides Islet. (See Light List.)

NORTH COAST.

Khrysokhou Bay lies between Cape Arnauti and Pomos Point, 14 miles east-northeastward.

There are several trading stations on the north coast where steamers call for cargo; they are marked on the chart.

Digitized by Google

The shore from Cape Arnauti trends southeastward 6½ miles to Latzi, and is rocky and rugged with small indentations.

Kakoskaliou Islet, 3 miles southeastward of Cape Arnauti and nearly ½ mile offshore, has some rocks near it. The islet affords no shelter.

Latzi is a trading station, with some stores; there is a small pier here, which shelters vessels from the sea breeze; the winter gales are said not to blow home.

Anchorage can be obtained in summer off the shore of Khrysokhou Bay, between Kakoskaliou Islet and Pomos Point, in moderate depths of water, and good holding ground. The bay is much frequented by coasting vessels, which come for corn.

The shore from Latzi trends northeastward; for 8½ miles it is a low sandy beach, of which the last 2 miles is fringed by a ledge of sunken rocks, whence to Pomos Point, a distance of 3 miles, it is rugged, and skirted by outlying rocks above and below water.

Polis village.—A small river from the mountains flows into the sea 1½ miles eastward of Latzi, and on its banks, about ½ mile inland, are the scattered houses of Polis village.

Pomos Point is low and sandy, with several rocks above water off it; shoal water extends 1 mile northwestward from the point.

Morphou Bay lies between Pomos Point and Cape Kormakiti, 23 miles northeastward. The shore from Pomos Point trend eastward 6 miles to Cape Kokkino, and thence east-southeastward 8 miles to Karavostasi; it is rocky, but Pyrgo Bay, where there are several springs of fresh water, lies 1½ miles eastward of Cape Kokkino.

Cape Limniti is situated 3½ miles eastward of Cape Kokkino, and Loutros Bay, small and sandy, lies between projecting cliffs under a small island on the eastern side of Cape Limniti. Pyrgo and Loutros Bays afford good summer anchorage in from 6 to 12 fathoms water, sand and weeds bottom, and are occasionally visited by vessels to load corn; native vessels also sometimes anchor in them in winter, but they go to sea on the first indication of a northerly gale, which they know from experience, when the anchorages become dangerous.

Karavostasi village is a number of buildings and stores, and is conspicuous from seaward. There is an iron pier here, 150 feet long.

Supplies.—About 2½ miles southeastward of Karavostasi is Lefka town, in a valley with luxuriant vegetation, where sheep, poultry, bread, eggs, etc., can be obtained; some of the best wines of Cyprus are made in this locality.

Mount Troodos (ancient Olympus), about 13 miles southward of Karavostasi, is 6,406 feet high, and thickly covered with pine trees. Near its summit is a military camp and a hotel, with which there is telegraphic communication in summer.

Digitized by Google

The shore from Karavostasi trends east-northeastward 4 miles and then northward 8 miles to abreast Ayia Irmi village; it is a low pebbly and sandy beach. About 3½ miles eastward of Karavostasi is Pendayia village.

Morphou town.—The mouth of the River Serakhis is situated on the eastern shore of the bay, 7 miles northeastward of Karavostasi, but it appears to be nearly lost in the beach. Morphou town is situated on the left bank of the river, about 4 miles southeastward from its mouth; its population was 3,228 in 1911. There is a railroad between Morphou and Famagusta, via Nicosia, and there are two trains daily.

The shore from abreast Ayia Irmi village trends northward 6½ miles to Cape Kormakiti, and is low and rocky, with foul ground extending about ½ mile off it.

Anchorage off the shore of Morphou Bay, between Karavostasi and Cape Kormakiti, although the depth is moderate and the ground good, is unsafe; it is open to the westerly or sea breeze, which causes a heavy sea and renders landing impossible.

Cape Kormakiti (ancient Crommyon Promontory) is the extremity of a low point of land, rising to a small flat-topped hill about 3 miles southeastward, from which steep and serrated ridges of hills and mountains run within and parallel to the north coast of the island eastward to Cape Andreas. A small islet, 20 feet high, lies close northward of the cape. Shoal water and rocky ground extend about ½ mile off the cape.

The coast from Cape Kormakiti trends east-southeastward 10 miles to Vavilas Point, from which shoal water extends ½ mile north-northwestward. Yeorgios Bay, on the western side of the point appears to be clear.

The coast from Vavilas Point trends eastward 4 miles to Akhiropietos Head. There is a trading station with stores 1¼ miles eastward of Vavilas Point. Anchorage can be obtained westward of Akhiropietos Head about 600 yards offshore, sand and mud bottom.

Supplies.—Provisions can be obtained from Lapithos town, about 2 miles southwestward, and Karavas town, about 1 mile southward of Akhiropiestos Head. Water can also be procured.

Mount Kornos, 2½ miles south-southeastward from Vavilas Point, is 3,106 feet high.

Akhiropietos Head is a projecting point with a monastery on its western side, and there is an islet off it; a spit extends 1 mile northward from the head.

The coast from Akhiropietos Head trends eastward 4½ miles to a point; Glykyotissa Islet, ¼ mile off the point, has the appearance of being fortified and there are rocks about 200 yards around it. The coast then trends eastward 1¾ miles to Kyrenia.

Digitized by Google

Kyrenia Harbor is an indentation in the coast, about 500 feet in extent, protected by moles. There is a depth of 4 fathoms in the entrance, but the general depth inside is 2 fathoms, and it has been dredged to a least depth of 1¼ fathoms. The harbor, which is only suitable for small vessels, affords but little shelter from northwest and northerly winds. Small coasting craft can lie alongside an extension of an old stone mole. A fort, built by the Venetians, stands on the eastern side of the harbor; it is now a prison; close northward of it is an ancient sea wall. The population of the town of Kyrenia which surrounds the harbor was 1,726 in 1911. There is a hospital, supported by Government, at Kyrenia.

Light.—A fixed red light is exhibited from the western molehead at Kyrenia. Visible 8 miles.

Supplies.—Provisions can be obtained, and water is laid onto a quay in the harbor in pipes.

Communication.—There is a road to Nicosia, 10 miles to the southward, with which place there is also telegraphic communication.

The coast from Kyrenia trends eastward 14 miles to Stazousa Point. There is a trading station at Vikla, 6 miles from Kyrenia, and Khoti Islet lies about 400 yards offshore 5½ miles farther eastward. Mount Buffavento, 6 miles southeastward of Kyrenia, is 3,135 feet high, and Mount Pentadaktylos is about 2½ miles farther eastward.

Stazousa Point is small, jutting out about ¼ mile from the coast line, and is bordered by rocks. The coast thence trends east-northeastward 31 miles to Cape Plakoti.

Phourni Islet lies about 400 yards off a small point, 5½ miles eastward of Stazousa Point. There are trading stations about 1 mile eastward of it; at Keminakia, 4 miles farther eastward, and on the coast 2¼ miles eastward of Keminakia. Karavopetra is a rock or islet about ¼ mile off a point 5½ miles eastward of Keminakia, and there is a sunken rock between it and the point. Galounia, 1¾ miles eastward of Karavopetra, is a ledge of rocks, extending about 600 yards offshore. There are trading stations on the coast southward of Karavopetra and eastward of Galounia. A reef extends about ¾ mile off the coast nearly 3 miles eastward of Galounia.

Cape Plakoti is a broad projection of the coast. Mount Pamboulos, 4½ miles east-southeastward of it, is 1,194 feet high. The coast from Cape Plakoti trends east-northeastward 21½ miles to Cape Andreas.

Cape Andreas—Klides Islet—Light.—See page 567.

Digitized by Google

CHAPTER XIII.

COAST OF SYRIA—KARADASH BURNU TO EL ARISH.

Gulf of Iskanderun, at the northern extremity of the coast of Syria, extends about 40 miles northeastward from its entrance, which lies between Karadash Burnu and Ras el Khanzir, 25 miles southeastward. The average width of the gulf is about 18 miles, and this continues almost to its head. The depth decreases gradually from 50 fathoms in the entrance to about 20 fathoms some 2 miles offshore, and there are no outlying shoals; the bottom is generally mud. The shores vary considerably, but are mostly plains at the bases of the mountains.

Taudi Dagh, a range on the northwestern side of the gulf, rises to the height of 1,995 feet 3½ miles inland from Ayas Bay. Ghiawur or Jawur Dagh (ancient Amanus Mons) reaches the height of 6,049 feet about 18 miles eastward of the northern extremity of the gulf; Alma Dagh, 7 miles southward of Alexandretta town, is 4,380 feet high, and commands the pass of Beilan, which leads to Aleppo. Southwestward of Beilan, Alma Dagh Range has serrated sides and numerous summits, while the sharp rocky ridge Jebel Karsarek or Rhoms trends west-southwestward, keeping nearly the same elevation, till its wooded slopes terminate in the rugged peak of Ras el Khanzir, 5,474 feet high.

Several mountain torrents and small streams flow into the gulf, the principal being Jaihun Chai, near Ayas Bay on the northwest shore, which is navigable for boats, and Deli Chai, near the Plain of Issus.

Sea level.—There is a rise of from 1½ to 2 feet water on the shores of the gulf at times; it is probably caused by winds.

The coast from Karadash Burnu trends east-northeastward 4 miles to a point, and shoal water of less than 3 fathoms, with ledges of rocks in places, extends from about 300 to 1,200 yards off it. From a point nearly 2 miles from Karadash Burnu several low rocks and islets extend 1¼ miles eastward and afford shelter to the small country boats; on the shore northwestward of the islets is the small village of Karadash Khan.

Anchorage.—There is anchorage during summer off the eastern islet, in from 4 to 6 fathoms, white sand, and vessels load with grain brought from the extensive Cilicia Plain to the northwestward.

Digitized by Google

Supplies.—Mutton and poultry are obtainable at Karadash Khan.

The coast from the point 4 miles east-northeastward of Karadash Burnu trends northward 1 mile and is rocky; it then continues eastward about 9 miles and is very low sand hills, almost steep-to, off which there is good anchorage, with strong northerly winds, in from 5 to 7 fathoms, sand, about 1 mile offshore. The coast then trends northeastward 9 miles to the mouth of Jaihun Chai; the 5-fathom curve is from about ½ to 1½ miles off it, and nearly 3 miles southwestward from the entrance to the river and 1¼ miles offshore is a sand bank with 3 fathoms water and 18 fathoms close seaward. An octagonal tower, ¾ mile westward of Ayas Town, bearing 28°, leads about 1 mile eastward of the bank.

Jaihun Chai (ancient Pyramus) is marked by the high reeds along its banks and the surf which usually breaks on the bar at its entrance. The depth on the bar is variable, boats occasionally not being able to enter, but there are from 12 to 16 feet inside. The tidal rise here is 3 feet. The river is about 80 yards wide, and the country around and inland abounds in wild boar, ducks, and woodcock. There is a ferry barge about 22 miles up the river capable of conveying several camels across at a time.

The entrance to the river is considerably southwestward of its position when surveyed in 1858, and the shoal water in the locality is said to have extended seaward since that survey. The sea is much discolored by the discharge from the river and has an appearance of shallows.

In April, 1880, there was a depth of 3 feet on the bar.

The Jaihun is formed by the junction of the Sugutlu, which rises east of El Bostan; the Khurman Su, which rises to the north and flows along the eastern edge of the Binboa Dagh; the large springs south of El Bostan; and the Gok Su, which rises near the ancient Cocussus. The river reaches the open country 7 miles westward of Marasch, where it is joined by the Ak Su; it then bends to the west, and passes through a remarkable defile between the Taurus and Ghiawur Dagh. The river is joined by many important tributaries, and is navigable as far as Missis, a distance of about 33 miles.

Caution.—The shoals formed by the alluvial deposits are extending seaward from the mouth of the river.

Water.—Good fresh water can be obtained from the river, as by examining the bar a passage in can generally be found, but the river water has been found brackish 5 miles from its mouth in autumn owing to the stream then being slow. To water here, anchor near the entrance of the river, in 8 fathoms, with Ayas Fort bearing 57° and the end of the Jaihun Spit 175°.

A creek leading from the river, about 6 miles within its entrance, into Ayas Bay, has a 10-foot channel, and water might be procured

Digitized by Google

there instead of from the main river, which can not be entered with southeast winds.

Ayas Bay (Mortalik).—The entrance to the bay is between the mouth of Jaihun Chai and the point on which is Ayas town, 5 miles northeastward; it extends about 6 miles westward, the western part being very shoal, with numerous lagoons on its shores. The land to the westward is low, undulating, thickly wooded hills, but to the northwestward the hills rise to Dedeh Dagh (Crag), 1,400 feet high, in remarkable rocky pinnacles, and Jebel Nur (Sharp Peak), an abrupt peak, 2,350 feet high, which from the southward is wedge shaped.

The north shore of the bay is cliffy, with a dry uncultivated plain stretching to the foot of the Taudi Range, which rises to heights of 1,450 and 1,995 feet and runs nearly parallel to the coast.

Spit.—An octagonal tower stands on the shore ¾ mile westward of the town. A rocky spit, a little over 200 yards wide, extends 1.4 miles southwestward from the tower; it has depths of from 4 to 5 fathoms, but near its outer end is a head with 3¼ fathoms. Dedeh Dagh in range with Bittern Point, bearing 290°, leads southward of the spit.

Bittern Point, near the middle of the north shore of the bay and 4 miles westward from Ayas town, projects about 600 yards from the shore line, is 90 feet high, and cliffy. A reef, which dries from 1 to 3 feet and has depths of from 2¾ to 3 fathoms close to its outer part, extends 600 yards southwestward from the point.

A rock with 5 feet water lies ½ mile westward from Bittern Point, and the ground is foul and uneven for nearly 200 yards southward of it.

Anchorage.—Ayas Bay affords anchorage in from 4 to 10 fathoms, stiff mud, sheltered except from east and southeast winds, which seldom blow for any length of time.

Between the reef extending from Bittern Point and the 5-foot rock westward of it, with the octagonal tower just open of the point, there is anchorage for small vessels in 3½ fathoms, soft mud. The holding ground in this part of Ayas Bay is considered to be generally good, but vessels sometimes drag their anchors.

Large vessels anchor in 6 fathoms ¾ mile southward of Bittern Point; the anchor sinks quickly into the soft mud.

Northerly winds cause the water to fall 2½ feet. During winter northeast gales commence with little warning.

Directions.—From the southward pass 1 mile eastward of the entrance to Jaihun Chai and keep the octagonal tower bearing northward of 20° until Dedeh Dagh bears 302°, when steer north-northwestward for Bittern Point and anchor as above directed.

Digitized by Google

The lead should be constantly used. Bittern Point in range with a conspicuous gap in the second range of hills, 331°, leads about 600 yards eastward of the 5-fathom edge of soundings off Jaihun Chai.

From the northward bring Bittern Point in range with the southwestern extremity of Dedeh Dagh, bearing 290°, which leads nearly ½ mile southward of the spit extending southwestward from the octagonal tower; then steer westward until Dedeh Dagh bears 296°, when a small table-land in the first ridge of hills westward of the bay is a little open to the northward of the dagh; this mark leads to the anchorage.

Landing.—The best landing place is at a dilapidated pier under a tower northwestward of Bittern Point, but it is only available for small boats, as the water is very shoal.

Ayas town (ancient Ægæ), situated within the walls of an old fort, is inhabited by a tribe of Turcomans; it is a wretched place, and is very unhealthful during summer and autumn.

Harbor.—Eastward of the town is a small harbor, with from 3 to 15 feet water, situated inside ancient moles built of large stone blocks, on the northern of which are the remains of a massive building. The harbor is fast filling with sand, but there is still sufficient water, with complete shelter, for small country vessels.

Supplies are obtainable from Alexandretta. During winter wild fowl resort to the lagoons; wild boar, hares, and partridges are also very numerous, and hyenas and jackals are occasionally met; fish and turtle are plentiful and easily caught with the seine. Good water may be obtained from streams on the northern side of Ayas Bay, and generally also from the Jaihun. There is no coal.

The coast from Ayas town trends northeastward 14½ miles to the northern extremity of the gulf. On a low promontory 5 miles northeastward of Ayas are the remains of a small fortress, some say the Castabolum of the Romans, which others place 8 miles farther northeastward. The coast then rises in undulating hills from 400 to 600 feet high, interspersed with sandy bays. On a low table hill, 8½ miles from the promontory, are the ruins of an ancient fort, and a little southwestward of it are some other ruins, supposed to be Castabolum, above mentioned. Along the range of hills to the northward of the table hill are the remains of a fine aqueduct; running 1½ miles up the valley it crosses it on arches, one being a gateway across the high road to Adana, which is said to be the Amanicæ Pylæ of the Greek historians and geographers; the acqueduct winds around the foot of the hills east-northeastward to extensive ruins in the middle of the Plain of Issus and then becomes lost.

The coast from the head of the gulf trends southeastward in an unbroken line of sand and shingle 13 miles to Bayas. There is a

Digitized by Google

tumulus about 600 yards within the beach, 8½ miles from the head of the gulf.

Plain of Issus, on the northeastern shore of the head of the gulf, is some 30 square miles in extent, marshy near the sea, and uncultivated. During winter numerous Turcoman and Arab tribes pitch their tents here for the rich pasturage it affords their flocks. There is a conspicuous white guardhouse at the western end of the plain.

The plain was the scene of the celebrated battle which decided the fate of the Persian Empire under Darius, and Alexander the Great gained western Asia. Two tumuli, situated a short distance from the beach, are supposed to mark the spot.

Deli Chai, or Mud Stream (ancient Pinarus or Issus), flows west-southwestward from Ghiawur Dagh and into the sea 10 miles from the head of the gulf. The road crosses it by a bridge near its mouth.

A large square yellow shed, with a red roof, is situated on the northern bank, at the mouth of the Deli. Anchorage has been obtained in 8 fathoms water, sand bottom, with the shed just mentioned bearing 28°, distant 1,700 yards, and Bayas Tower 151°.

Koi Chai, or Village Stream, falls into the sea about ½ mile farther southeastward. A plain, which extends about 9 miles northward from Bayas and about 4 miles inland, is well cultivated to the foot of the hills.

Bayas (Baiæ of the Romans), a fortress and village situated amid groves of trees at the foot of the steep craggy Ghiawur Dagh, is deserted and falling into ruins. It appears to have been a most formidable and important position; massive buildings still exist.

The ancient port is now partly inland and filled with sand and stones; the moles in the sea are still visible. Northward of it are the ruins of a square tower. There is open anchorage off the port in from 8 to 10 fathoms, coral and sand, but from these depths the water shoals quickly toward the shore. A sounding of 6 fathoms was obtained by the British naval vessel *Astræa* in 1897, with Bayas Tower bearing 126°, distant 2¼ miles; the depth increased gradually to 10 fathoms 1 mile southwestward, and there are depths of 7 and 8 fathoms about ½ mile southeastward.

The coast from Bayas trends southward 7¾ miles to Mukir el Khan, the northern point of Iskanderun Bay. Merkez village is situated about 4 miles southward of Bayas and 1½ miles inland, and Sari Sakliyeh village is near the shore, nearly 2 miles farther southward. Kalatissia, a fortress of the Middle Ages, in ruins, is ½ mile southeastward of Sari Sakliyeh, on the slope of a low range of hills.

On a rocky cape about ½ mile southwestward of Kalatissia are the Pillars of Jonas (ancient Pylæ Cilicia), called by the Turks Sakal Tutan, or Beard Catcher, which are the ruins of a fine limestone arch.

Digitized by Google

Iskanderun, or Alexandretta Bay.—The shore of the bay from Mukir el Khan trends southward 2 miles and then turns southwestward ¾ mile and west-northwestward ¾ mile to its western point. The town and port are situated on the southwestern shore of the bay.

Lights.—Two fixed white lights are exhibited from a small white hut with a red roof, surmounted by a skeleton iron mast, 20 feet high, situated about 600 yards southwestward of the western point of the bay.

A light is exhibited from the end of the customhouse jetty, visible 10 miles. (See Light List.)

Anchorage.—Alexandretta Bay is the safest anchorage on the coast of Syria, the only winds which blow home being northerly, and these, although they occasionally interrupt landing for a few hours, are never strong enough to cause a vessel with good anchors and cables to drag. Anchor as convenient; a good position for a large vessel is in about 13 fathoms water, with the British consulate flagstaff bearing 192°, ½ mile, and there is also anchorage in 6 fathoms, with the outer end of the customhouse pier bearing 215°, 600 yards; the bottom is stiff sand and mud. The anchor should be sighted occasionally, as the winds are generally very variable.

Directions.—In approaching Alexandretta from the westward, especially at night, do not round the western point of the bay closely, as the water shoals suddenly off it, and the distance of the coast is very difficult to estimate on account of the highland behind.

Alexandretta (Iskanderun) town is situated on the low shore eastward of the lighthouse, and is surrounded by swamps which produce intermittent fevers during summer, but the sanitary condition has been much improved by drainage. The town contains some tolerable buildings, as the customhouse, storehouses, and the residences of the consuls; the houses generally are one story high, and the streets are narrow.

The Government buildings, the Roman Catholic Church, the minaret of the mosque, and the black chimney of a factory eastward of the town are conspicuous. There is a square ruined house on the low western point of the bay, and close westward of it is a barrack with castellated roof, which is noticeable from the westward; farther westward is a factory.

The population in 1906 was about 12,000, but the town is almost deserted by its inhabitants during summer, when it is unhealthful.

The town is the port of Aleppo (Haleb), to which place there is a road nearly 100 miles in length; it goes through Beilan Pass, 6 miles southward of the town, at a height of 1,580 feet. The road is often out of repair and almost impassable after winter rains for vehicles, of which there are few, merchandise being carried by camels.

Digitized by Google

Consul.—The United States is represented at Aleppo by a consul and vice and deputy consul; at Alexandretta by an agent.

Harbor works.—Important harbor works are proposed.

Piers.—There are seven small piers on the shore of the bay close to the town, which afford accommodation for loading and discharging cargo from lighters, but the water is very shoal at their outer ends; except the new customhouse pier, they are built of wood on steel rails for piles.

The new customhouse pier, 25 yards eastward of the old one, is 360 feet long, 36 feet broad, about 10 feet high, and has 5 feet water at its end. It is strongly built on crossed steel girders, with a wooden floor, and has two cranes, the one at the end being a steam crane of 1½ tons. There is a landing at the inner end of the pier, about 5 feet above water. The customhouse is at its inner end.

The usual landing places for boats of naval vessels are on the beach, in front of the consulate, and the new customhouse pier, but this pier has a bank with 3 feet water off its outer end, so it is necessary for steamboats to bring in a small boat in tow. With northerly winds or swell there is a break on the bank and a strong easterly current off the pier; under these circumstances boats going to the pier should turn to seaward outside the breaking water, back in, and get a line ashore as quickly as possible.

A small wooden pier projects 24 yards from the shore 400 yards eastward of the lighthouse, and there is a depth of 6 feet at its outer end; it belongs to the factory close-to.

Winds.—Fine weather, with light southwesterly winds and land and sea breezes, prevails from the beginning of May till the middle of September. Thence to the end of December is the rainy season, calms and light airs prevailing, with frequent rain. From the beginning of January till the middle of February the weather is usually fine, but interrupted by northerly gales, and although these blow home into the bay, owing to the short fetch from the northern part of the Gulf of Iskanderun, they do not cause a very heavy sea, but they raise a surf on the beach which prevents landing. A good sign of the approach of a northerly gale is a collection of fleecy clouds over the Plain of Issus, and the disappearance of these clouds indicates a cessation of the wind. The gales usually commence at sunrise or sunset and last about 24 hours, there being a lull about noon and also just after sunset, when landing is usually possible. From the middle of February to the end of March southerly and southeasterly winds prevail, with occasional southwesterly winds, which blow with great force in the gulf, but are not felt in the bay, smooth water extending about a mile from the anchorage.

39148—16——37

Digitized by Google

In April calm and light airs prevail, with strong easterly gales, known as "raghiehs," which are followed by strong westerly winds. The raghieh is not felt with any force at the anchorage, owing to the mountains to the eastward, but it blows into the gulf, northward of Ras el Khansir, through Beilan Valley, and also into the Bay of Antioch, through Orontes River Valley.

Trade.—The imports are principally manufactured goods, drugs, indigo, copper, leather and hides, sugar, silk manufactures, coffee, wine and spirits, provisions, metals, ironware, tobacco, specie, jewelry, petroleum, and cloth; the exports, wool, cotton, grain, pistachio nuts, leather and hides, liquorice, native manufactures, butter, silk cocoons, copper, specie, and cattle. Antimony, manganese, chrome, boracite, and bitumen are found in the mountainous country near Alexandretta.

Supplies.—Cattle, vegetables, and poultry can be obtained. Water is supplied to the town from two copious springs which issue from a low hill about 1 mile to the southward; it has to be brought in on donkeys.

Water for shipping is sent off in boats, carrying 3 tons, on application to the harbor authority, and it can also be obtained, except during westerly winds, from a mountain stream about 2 miles northward of the town.

Repairs.—There are no facilities for repairs.

Coal.—The Anglo-Syrian Trading Co. (Ltd.), of Manchester, can supply any quantity of coal and patent fuel if from 30 to 35 days' notice is given. No stock is maintained.

Communication.—A railroad from Alexandretta to Toprakaleh, a distance of 32 miles, was opened for traffic in 1913. There is telegraphic communication.

The coast from Alexandretta Lighthouse trends southwestward 25 miles to Ras el Khanzir, and is plains, with several scattered villages, near the sea, rising to thickly wooded hills, and some 6 miles inland to mountains from 4,000 to 5,000 feet high.

Arsus (ancient Rhosus) is a very small village about 17 miles southwestward of Alexandretta Lighthouse and on both sides of a shallow stream flowing into the southern part of a bay, the entrance to which is 2 miles wide. The ruins of the ancient walls of the town are still visible on the southwestern side. A white church or tomb stands near the northeastern point of the bay, which is low and rocky, whence the shore becomes low, sharp-peaked hills. The southwestern point of the bay is small and projects northwestward; on it is a large, white house with a red roof. The bay affords good summer anchorage in 4½ fathoms, sand, inside a rocky ledge of 3 fathoms, extending about 1 mile southwestward from the northeastern point. Much wood is exported from here. Burunli, 4 miles southward of Arsus, also

Digitized by Google

affords temporary anchorage to vessels loading with wood from the hills in the locality. The coast for some 6 miles on both sides of Arsus should not be approached nearer than 1 mile, as there are several outlying patches of rock.

Ras el Khanzir (ancient Rhossicus Scopulus), the western termination of a ridge of the Alma Dagh, is high and steep. The land rises to the height of 5,474 feet 3 miles east-southeastward of the ras, which has the appearance of a boar's snout from seaward. On the mountains in the vicinity are forests of oak, fir, and boxwood.

About 2 miles southward of the ras is a cliffy point, off which a rocky ledge extends southwestward nearly ¾ mile; there is a rock awash at its outer end. In the vicinity of the ledge keep 1½ miles off the land; the green hills westward of Arsus open northwestward of Ras el Khanzir, bearing about 46°, leads northwestward of the ledge.

Antioch Bay lies between the cliffy point 2 miles southward of Ras el Khanzir and Ras el Bazit, 26 miles to the southward, and it extends eastward 9 miles. The 100-fathom curve is 2 miles offshore at the mouth of Nahr el Aasi, while 5½ miles farther southward it approaches to ½ mile from the shore.

The shore from the point southward of Ras el Khanzir trends south-southeastward 19 miles to the head of the bay; southward to Ras el Mina, a distance of 11½ miles, it is long beaches with occasional cliffs and outlying rocks, none of which, however, are more than 600 yards from the shore. The land is steep and thickly wooded, and rises rapidly to Jebel Musa Range, the summit of which, 2,860 feet high, is about 3 miles north-northeastward of Ras el Mina. There are numerous deep ravines on the western slope of the range, down which streams run during the greater part of the year.

Ras el Mina is well defined and conspicuous; a small white islet and several rocks lie off it; a plain extends from the ras to Nahr el Aasi, 5 miles southward.

Seleucia.—The extensive ruins of the ancient city and port of Seleucia Pieria are situated immediately to the southward of Ras el Mina.

The city stood partly on the plain and partly on the lower slope of a spur of Jebel Musa (ancient Mons Pieria), whence the name of Seleucia. The site, formerly occupied by buildings, is about 4 miles in circuit; the ruins are massive walls, a theater, sarcophagi and rock tombs cut in the cliffs, and having a white appearance, are noticeable from a distance seaward.

The port was on the level ground westward of the city and was a remarkable work. It was a great dock excavated in the plain and connected by a canal with the sea; the entrance is marked by two moles of immense blocks of limestone.

Digitized by Google

But a more remarkable work was an excavation immediately northward of the port through the side of the mountain and leading from the upper part of the ancient city to the sea. It was alternate cuttings, 120 feet deep and 22 feet wide, and tunnels, 24 feet high, carried through compact Tertiary limestone for a distance of 1,048 yards. Its eastern end, about 30 feet above the sea, terminates in a ravine or torrent bed, across which a strong dam was built to direct the stream into the tunnel. The object of this work was to turn off the waters coming down the mountains southward of the town and protect the city and the port from floods.

Two miles southward of Seleucia and near the beach is a conspicuous white domed nebi or tomb, dedicated to Khudr or St. George.

Landing on the beach in this locality is sometimes dangerous on account of the heavy surf.

Suweidiya village, 1½ miles inland of the tomb just mentioned, is marked by a cluster of poplar trees and surrounded by orchards and mulberry plantations. There is a factory worked by steam here, and large quantities of silk and grain are produced, and chiefly sent to Aleppo.

Nahr el 'Aasi, or Orontes River (ancient Axius).—The mouth of the Nahr el 'Axsi, or Orontes River, is near the middle of a long line of beach. The river is a sluggish stream about 100 yards wide and 9 feet deep within the bar. There is generally a depth of from 3 to 5 feet on the bar, but at times in summer it is difficult to enter in a small boat. In winter vessels of about 100 tons enter and proceed about 3 miles, at which distance the river is fordable in summer.

The river from its source in the northern portion of the valley of Cœle Syria, which is 4,000 feet high, flows northward 12 miles along the base of the Lebanon; then it makes a bold sweep westward till within 3 miles of Antioch, where it is joined by the Kara Su; here it turns southwestward to the sea through a rich plain and valley between Akkra and Alma Dagh Ranges. The plain affords excellent grazing and abounds in fruit, especially pomegranates and grapes; hares, partridges, woodcock, francolin, snipe, and quail are plentiful.

Anchorage.—The usual anchorage for vessels communicating with Antioch is off Nahr el Aasi Bar, in 9 fathoms, mud, ½ mile from the shore, with Khudr Nebi bearing 358°.

The anchorage is open to northwest, through west, to southwest winds, and a heavy swell rolls in which breaks on the bar.

Antioch (Antakiyeh of the natives), on the left bank of the river and distant 13 miles from the sea direct or 20 miles by the course of the stream, is situated at the western foot of Mount Silpius, a craggy hill 1,200 feet high. On Mount Silpius are the ruins of remarkable

Digitized by Google

towers 30 feet square and ancient walls 50 feet high, extending over a circuit of 4 miles. The modern town, built within the walls and on the western face of the old city, extends irregularly 2 miles along the banks of the river, and is said to contain a population of about 6,000; it was nearly destroyed by an earthquake in 1872.

The principal products are fruits, sugar cane, leather and goat's hair; it has manufactories of coarse pottery, cotton stuffs, and silk culture.

The shore of the bay from the mouth of Nahr el Aasi trends south-southeastward 3 miles and then southwestward about 13 miles to Ras el Bazit.

Kessab Bay, about 7 miles from Nahr el Aasi, is small. Jebel Akkra (ancient Casius), 2 miles eastward of it, is 5,800 feet high, rising abruptly, and is conspicuous from the southward. The upper part is entirely bare, but the base and ridges which branch off to the eastward are thickly wooded with oak and pine.

Bazit Bay lies between Pigeon Islet, low and small, situated close to the shore 2¼ miles southwestward of the southwestern point of Kessab Bay, and Ras el Bazit, 5 miles west-southwestward; vessels load chromate of iron here by lighters. A cliffy point 2½ miles south-southwestward of Pigeon Islet, on the summit of which is the white Nebi Khudr, is noticeable; there are several rocks above water within 400 yards of the shore eastward of the point. The ruins of ancient Posidium are situated about 2 miles west-southwestward of the point just mentioned; an ancient mole extends a short distance eastward from the ruins, and a ledge of rocks projects about 600 yards northward.

Anchorage.—The best anchorage is in 8 fathoms water, sand and mud bottom, off the ruins of the ancient town (Posidium), with the northern extremity of Ras el Bazit bearing 271°, and the mole end 236°, distant about ½ mile. The water deepens rapidly outside the anchorage, there being depths of 30 fathoms about 1¼ miles offshore.

Supplies.—Good water can be procured from a small river 1.3 miles eastward of the mole, and a few cattle can be obtained at the village situated on the eastern slope of the table-topped hill southeastward of Ras el Bazit.

Ras el Bazit (ancient Posidium) is low, but rises to a flat-topped limestone hillock, 165 feet high, 2 miles southeastward, which, and a remarkable point 1 mile southward of the ras, crowned by a ruined watch tower, are good marks.

Current.—The current near Ras el Bazit usually sets northward at a rate of from 1 to 1½ miles an hour.

The coast from Ras el Bazit trends south-southeastward and south-southwestward 11 miles to Ras el Fasori, and generally is bold

Digitized by Google

cliffs, with a few sandy beaches, the water being deep close-to. Sabagli, an open road 3 miles southward of Ras el Bazit, is visited by steam vessels to load chromate of iron. On the northern side of Ras el Fasori is a bay, with an islet about 400 yards long east and west and narrow, close to its southern shore, and about 1,200 yards northward of the islet is a rocky patch with 3 fathoms water.

Ras el Fasori is a conspicuous promontory, and from it the coast trends southward nearly 3 miles and then southwestward 3¼ miles to Ras Ibn Hani, continuing bold cliffs, with some sandy beaches, and deep water close-to.

The water off Ras el Fasori is very deep, there being 180 fathoms at the distance of less than ½ mile.

About 3 miles southward of Ras el Fasori is a bay, ½ mile wide at its entrance, which extends southeastward 1,200 yards, the depth decreasing from 4 fathoms.

Minat-el-Kaban Anchorage.—About 1 mile south-southwestward of the southern point of the bay just mentioned is a rocky point, with a monastery on it, situated between two sandy bays which are encumbered with rocks. There is anchorage off the point in 8 fathoms, white sand, with Ras Ibn Hani Lighthouse bearing 246° and the monastery 158°; here there is good shelter, with smooth water, from the strong southwest summer breezes, and when communication at Latakiya is impracticable, letters and dispatches can be forwarded there by horse in one hour.

Ras Ibn Hani is the northwestern point of a low peninsula which projects about 1¼ miles west-southwestward from the western of the two sandy bays just mentioned, with a width of ½ mile. The coasts of the peninsula have been extensively quarried, and on its summit are the remains of a temple and other ruins.

From a distance southward the ras appears as a chain of small rocky islands, with the lighthouse well to seaward.

Light.—A flashing white light is exhibited, at 46 feet above high water, from a white stone tower situated about 66 yards eastward of Ras Ibn Hani,visible 13 miles. (See Light List.)

The coast from Ras Ibn Hani trends southeastward 3½ miles and then southward 2¼ miles to Ras Ziaret. On the southern side of Ras Ibn Peninsula a bay about 1 mile broad extends nearly 1 mile east-northeastward; it has depths of from about 1¼ to 2 fathoms, but a rocky reef stretches almost across the entrance.

Latakiya (ancient Laodicea), situated on the promontory of Ras Ziaret, is an upper and lower town, separated by olive plantations and gardens. Marina, the lower town, stands on the north border of the ancient port, now fast filling up, and affording shelter only to a few small coasting vessels.

The population of the two towns in 1913 amounted to about 20,000.

Digitized by Google

Light.—A fixed red light is exhibited from the top of a staff on the old fort at a height of 90 feet above sea level, situated on El Burj Islet, in the northern part of the entrance to the ancient port.

Anchorage.—Anchor in from 8 to 10 fathoms, sand, with El Burj bearing about 90°, distant from ½ to 1 mile, but this anchorage being open should be used only temporarily.

Directions.—From about 10 miles seaward Latakiya appears as a flat island, with a grove of olive trees along the summit and a high minaret on its southwestern side. When approaching from either northward or southward do not shoal the water to less than 11 fathoms until near the anchorage.

Trade.—The principal exports are cereals, tobacco (bearing its name), eggs, dried figs, and the imports cotton and woolen goods, rice, coffee, petroleum, wheat, and flour.

Supplies.—Fresh provisions and fruit are obtainable at the market at moderate prices. Good water can be procured free. There is no coal in stock.

Communication.—There is telegraphic communication by land lines.

The coast from Ras Ziaret is rocky cliffs, with a sandy beach, for about 1 mile; then a sandy beach continues southeastward nearly 8½ miles. Although the depth of water off it is moderate, anchorage is not recommended here, as it is open to southerly and southwesterly winds.

About 1½ miles from the northern end of the beach is the mouth of Nahr Kebir, the largest river on the coast; it is crossed by a bridge about 1 mile within the entrance.

Tartarus Bank is a rocky patch nearly 1 mile long north and south, its northern end lying about 2¾ miles, 195°, from Ras Ziaret; it has from 14 to 18 fathoms water and 32 to 45 fathoms around; the 100-fathom curve is less than ½ mile westward of the bank, and there is a confused sea in the locality during southwest gales.

This bank and other ledges on the coast are frequented by sponge divers from Kalimno and Symi, in the Grecian Archipelago.

The coast from the southern end of the sandy beach just mentioned trends southward 9¼ miles to Ras Beldi el Melek, in a line of low cliffs, within which is an extensive and partly cultivated plain, gradually rising eastward toward the high range of hills which runs parallel to the coast. The natives of this plain have a bad name, and should not be trusted.

Jebelli.—Nearly 4 miles from the commencement of the cliffs and close to the coast is Jebelli (ancient Gabala), a small wretched village built from the ruins of the old town. There are here a number of excavated tombs in the rocks, the ruins of a magnificent theater, and the remains of a small port.

The mosque at Jebelli is a good mark.

Digitized by Google

Rocks.—About ¾ mile northwestward of Ras Beldi el Melek and ½ mile offshore are two low rocky islets surrounded by rocks.

Beldi el Melek.—On the northern side of Ras Beldi el Melek is the mouth of Nahr el Sin, a deep stream which rushes into the sea through the rocks, where a vessel might water in fine weather. On its south bank and just within the ras is Beldi el Melek, the ruins of the ancient Paltos, a heap of stones and rubbish with numerous columns.

The coast from Ras Beldi el Melek, a long, straight beach, trends southward 4½ miles to Banias (ancient Balanea), a ruined site, similar in character to Beldi, lying at the northern base of a volcanic hill 930 feet high.

Markhab Castle, on the summit of the volcanic hill, is a conspicuous fortress, capable of accommodating some 7,000 troops, and the center of numerous villages inhabited by a lawless set. On the western spur of the hill and about ¼ mile eastward of Ras el Burj, its extremity, is a square black tower between 50 and 60 feet high. A little distance from the shore, with the middle of Markhab Castle in line with the tower, is a curious spring of fresh water which rises to the surface from a depth of 18 fathoms with considerable force and has the appearance of breakers; the water at the surface is brackish.

The coast from Markhab trends southward 16 miles to Tartus, and is mostly shingly beaches with outlying rocks and shallow patches; it should not be approached nearer than 2 miles.

Ras el Hassan, 10 miles from Markhab, is rocky, and Ipsiri Islet, ¾ mile southwestward of it, is small, low, and rocky. A rocky patch with 3 fathoms water lies 2¾ miles 189° from Ipsiri Islet, and is the commencement of a line of rocky patches, which, with from 2 to 5 fathoms water, extends southward to abreast El Kulat at from 1¼ to 2 miles from the shore.

El Mina, about ½ mile northward of Tartus, is a shallow basin, probably an ancient port; small country boats and spongers shelter here. On the eastern side of El Mina is a pottery, a large building.

Tartus (Tortosa of the Middle Ages and Antaradus of the Greeks) is a walled town of considerable extent on the coast, with a population of about 3,000. The land side is defended by a double wall with towers; about 100 yards outside and southeastward of the town is a cathedral, 92 feet high, built in Gothic style, and conspicuous from seaward.

The coast from Tartus trends south-southeastward 21½ miles to Nahr el Arka, and is a shingle beach, bordered by shoal water, with off-lying rocky patches.

Ruad Island (Arvad of Scripture and Aradus of the Greeks), 2 miles south-southwestward of Tartus, is 800 yards long north-northwest and south-southeast, 400 yards broad, red sandstone, and 79

Digitized by Google

feet high; it affords the best shelter along the coast for vessels of less than 15 feet draft. A large dismantled fort crowns the middle of the island, with smaller ones at each corner; these were built to protect the inhabitants from the attacks of Greek corsairs. On the western side of the island are the remains of a double Phœnician stone wall; on the northwest point a portion upward of 30 feet high still exists, and two ancient moles, constructed of huge stones, extend about 100 yards from the eastern side; between these was another mole, thus forming two harbors. There is a population of about 3,000, whose chief occupation is sponge diving, those obtained here being very large and of fine quality. Water is obtained by collecting rain in large tanks cut out of the rock.

Light.—A flashing white light is exhibited, at 92 feet above high water, from the highest tower of Ruad Island Fort, visible 16 miles. (See Light List.)

Shoals.—Within ¾ mile northward of the island are five rocky patches, with 2¼ and 3 fathoms water.

Anchorage.—In approaching the anchorage on the northeastern side of Ruad Island, pass close northward of the island, which is bold, to clear a rocky patch with 3 fathoms water situated 200 yards northward of it; then steer east-southeastward and anchor in from 5 to 6 fathoms, sand and mud, good holding ground, with the minaret just open northward of the central mole, bearing 250°. Small vessels anchor nearer the island. Strong southwesterly winds send in a very heavy swell.

There is a 3-fathom passage southward of the island, but from the rocky uneven nature of the bottom it is not recommended.

Supplies.—Beef and vegetables can be obtained from Tartus, and turtle and fish are plentiful. Good water can be procured from a mainland stream 1¼ miles northeastward of the anchorage; there is a small hillock on the southern bank of the stream.

Reefs and islets.—A line of rocky ground, with from 1½ to 4 fathoms water, on which a heavy sea breaks in westerly gales, extends about 7 miles 164° from Ruad Island and 1½ miles offshore. The following four small, and extensively quarried, rocky islets are situated on the reefs: El Abas, 14 feet high, distant 2 miles; Abu'l Faris, 7 feet high, nearly 4 miles; El Fana and Makrud, 7 feet high, close together, 4½ miles from Ruad. As the depth outside the reefs increases rather quickly, they should not be approached to less than 14 fathoms.

Ruins of Marathus.—On the mainland, about 2¾ miles southeastward of Ruad Island, are two monuments; the higher, about 32 feet high, is a large cylindrical block on a square pedestal, surmounted by a cone-shaped stone; the other, 20 feet high, is two blocks; the lower block, which has rudely sculptured lions at the

Digitized by Google

angles, being surmounted by a single stone with a domed top. In the vicinity are extensive quarries and several mausoleums and tombs, the ruins of a temple hewn out of the rock, and fragments denoting the site of a large city, possibly the ancient Marathus.

The coast.—At Marathus the hills recede inland, leaving a large cultivated plain studded with tumuli, on most of which are villages, between them and the sea. Haman village is situated on the coast 5½ miles southward of Marathus. Five rivers intersect the plain, winding westward through the opening in the mountains (known as the entrance of Hamath), between Nusairiyeh Range and Jebel Akka, the northern peak of Lebannon Range. Nahr el Kebir (ancient Eleutherus), the largest of the rivers, flows into the sea 14 miles southward of Ruad, and Sheik Jabber, on the northern side of its entrance, is a remarkable nebi.

Shoals.—A shoal with 2 fathoms water lies 2 miles southwestward from Haman village; it is a continuation of the line of reefs from Ruad Island, which extends along the coast southward to El Kulat. There is a 4-fathom patch 1¼ miles southward of the shoal just mentioned and a 4-fathom patch 5¼ miles southward of Haman village. The coast should not be approached nearer than 2½ miles nor to less than 15 fathoms. Ruad Island open westward of Makrud or El Abas Islets leads westward of but close to the shoals.

El Kulat, 3½ miles southward of Sheik Jabber and 1½ miles inland on the summit of a tumulus, is a large and conspicuous ruin, 142 feet above the sea.

The coast from the mouth of Nahr el Arka trends southward and west-southwestward 3 miles to the mouth of Nahr el Berid.

Kalat Hakmone (ancient Orthosia) are two mounds covered with ruins, lying at the mouth of Nahr el Berid; here the highland again approaches the sea.

The coast from Kalat Hakmone trends southwestward 4 miles to Ras el Lados, a rocky bluff 129 feet high, which is the termination of one of the spurs from Jebel Turbul, a round-topped mountain, 2,314 feet high, with a village on its eastern shoulder; the mountain is a good mark. The coast from Ras el Lados trends westward 4½ miles and terminates in the low El Mina Point.

Tripoli (ancient Tarabulus), situated about 1 mile within the mouth and on both banks of Nahr Abu Ali, or Kadisha River, which flows into the sea 2¾ miles westward of Ras el Lados, is a well-built town surrounded by luxuriant gardens. The population, including El Mina, is estimated at 35,000. A large and conspicuous castle stands on a hill, 197 feet high, in its southern part, but it is fast falling into ruins. El Mina or Scala of Tripoli is built on the low promontory which terminates in the northwest point of the coast. Along the coast westward of the mouth of Nahr Abu Ali is a line of square

Digitized by Google

towers; the eastern one at the mouth of the river is scarcely visible from seaward, being obscured by trees; the one next westward, named the Tower of Lions, is 76 feet high, and conspicuous from the approach to the anchorage.

Rocks.—A chain of low rocks and islets extends 3¾ miles northwestward from El Mina Point.

Channel.—There is a channel nearly ½ mile wide, with 6 fathoms least water and navigable by steamers, between Sanani and Ṭares, two of the chain of islets extending off El Mina Point.

Lights.—A fixed white light is exhibited, at 67 feet above high water, from a tower surmounting a white dwelling with a red roof on the summit of Ramkine Islet, the outer of the chain of rocks and islets just mentioned. Visible 14 miles.

A fixed red light is exhibited from a round white building, with a green domed top, situated between El Mina health office and customhouse, but the lighthouse is not easily distinguished, owing to the background of white houses. Visible 6 miles. (See Light List.)

Anchorage.—Large vessels usually anchor in Tripoli Roads with the Tower of Lions bearing about 165° nearly 1¾ miles, and the northern extremity of Bellane, an islet 21 feet high, bearing 236°, in 7 fathoms water. Small vessels anchor with the Tower of Lions in range with Tripoli Castle bearing 145°, and the round tower on El Mina Point in range with the chapel on Ras esh Shuka, in 3½ fathoms, sand and weed. From the anchorage Ras esh Shuka is obscured by houses, unless the observer's eye is 26 feet or more above the sea.

In northeasterly gales there is anchorage southwestward of El Mina Promontory, with the cemetery mosque bearing 59°, 1.1 miles, and Tripoli Castle bearing 95°, in 10 fathoms water.

Directions.—For Tripoli Roads, from the southward, steer to pass ½ mile or more westward of Ramkine Islet Lighthouse; then steer northeastward till the lighthouse bears 180°, when steer eastward until the Tower of Lions is in range with Tripoli Castle bearing 145° and thence to the anchorage.

The large house or convent of Dar Natur in range with a remarkable notch near the eastern end of the table of Ras esh Shuka, bearing 203°, leads through the channel between Sanani and Tares, passing about 250 yards from the shoals on each side; when Rankine Islet Lighthouse is in range with the northeastern point of Sanani, steer eastward until the Tower of Lions is in range with Tripoli Castle and then direct to the anchorage.

At night, from the southward, do not shoal the water to less than 20 fathoms when rounding Ramkine Islet Light; when the light bears 180° ½ mile, steer 90° until the light bears 244°, then steer 132°, and anchor in 7 fathoms with El Mina Light bearing 192° and Ramkine Islet Light 292°. A small vessel can approach El Mina Light when

Digitized by Google

bearing 192°, and anchor in 4 fathoms with Ramkine Islet Light bearing 305°.

Landing is practicable at El Mina, except in strong northerly winds, at the port office mole or a mole westward of it, for boats of 5 feet draft, but the stones of the ancient mole, about 600 yards to the northward, must be avoided.

There is a good landing for boats on the sand beach on the southwestern side of El Mina Promontory, to the southward of the ancient wall, during strong northeasterly winds.

Trade.—The exports are principally grain, silk, lemons, oranges, dried cocoons, skins, soap, and sponges, and the imports sugar, petroleum, salt, cotton threads, hides and leather, hardware, dry goods, cereals, and sundries.

Coal.—About 3,900 tons of coal and patent fuel are imported annually, and there are usually 1,100 tons in stock; coaling is performed by lighters, of which there are 30, of from 15 to 30 tons. There is a coal wharf 120 feet long, with a depth alongside of 6 feet.

Supplies.—Meat, vegetables, and bread are plentiful, and water can be procured from Nahr Abu Ali; boats can get close in, where they are sheltered by the sandy point from the strong southwesterly breezes. Good water can also be obtained free from a spring near the landing place, or it can be taken to a vessel in the anchorage by tank vessels.

Communication.—There is a railroad from Tripoli to Homs, where it joins the line from Aleppo to Damascus and Medina. There is telegraphic communication.

The coast from El Mina Point trends south-southeastward 2¾ miles, and is mostly a sand beach partly bordered by rocks; it then trends southwestward 1½ miles, becoming rocky, and rises to Mar Yakub, 749 feet high, on which there is a monastery. A rocky patch with 2¼ fathoms water lies nearly ¾ mile offshore with the monastery bearing 122°, and there are other patches of 2½ and 3 fathoms inside it.

The coast from westward of Mar Yakub trends west-southwestward 3 miles to Ras Natur, on which there is a large square building. One mile southwestward of Ras Natur is Burj Enfeh, a ruin, on a rocky islet close off a projecting point; on the southern side of the point is Enfeh village.

El Hereh Bay, between Ras Natur and Ras esh Shuka, 4½ miles southwestward, extends 1½ miles southeastward, and is semicircular in shape, the northern part near Enfeh village being rocky. Here a copious fresh-water spring bubbles up from a depth of 14 fathoms, and mixing with the salt water causes a smooth oily appearance, but sometimes there is a strong ripple and it may look like a shoal.

Digitized by Google

Anchorage.—There is good anchorage, sheltered from the strong southwest summer breezes, in 9 fathoms, white sand, in the southern part of Il Hereh Bay, off Mar Saman Monastery (which is situated on the side of the cliff amidst thick foliage), with Burj Enfeh bearing 20°.

Lebanon Range, or Jebel Libnan.—Jebel Akka, the northern peak of the range, is 6,980 feet high and situated 15 miles eastward of Jebel Turbul. After a slight bend southeastward from Akka Peak the range trends south-southwestward 70 miles. Southward of Jebel Akka the range falls, but 6 miles southwestward of the peak it rises again in a high bluff shoulder, 4½ miles southwestward of which is Dhor el Khodib, 10,061 feet high, the highest peak of the range. The other principal peaks are Jebel Makmel, 9,996 feet, 2½ miles southward of Dhor el Khodib; Jebel Sunnin, 8,162 feet, 18 miles eastward of Beirut; Jebel Keneiseh, 6,666 feet, 8 miles southwestward of Jebel Sunnin; and Tomat Niha or Sidon Paps, 5,620 feet high, 13 miles eastward of Saida. These peaks are visible from seaward.

The Cedars of Lebanon are a group of trees situated on the western slope, 6,700 feet high, of the range westward of Jebel Makmel, and are visible from seaward in the vicinity of Ras esh Shuka. The source of Nahr Abu Ali is in the gorge southward of the cedars.

Ras esh Shuka, or Cape Madona (ancient Theuprosopon), is a projecting table-land, 618 feet high, with a chapel on its northwest edge; its sides are precipitous and wooded, with several white patches on its northern face.

The coast from Ras esh Shuka trends south-southwestward 2¼ miles to Ras Selata, and from about ¾ mile from Ras esh Shuka is bordered by rocky ledges; here the coast should not be closed to less than 1 mile.

Ras Selata has a tower on it, and is steep-to.

The coast from Ras Selata trends southward 15½ miles to Ras Mameltein, and is rocky capes, the terminations of the high rugged spurs from the Lebanon, with small sandy bays; it has a barren aspect.

Batrun (ancient Botris), 1 mile southward of Ras Selata, is a small village; the remains of the ancient port are still visible. Vessels occasionally anchor off the village in 10 fathoms, sand.

Jebeil (ancient Byblus), 8½ miles southward of Batrun, is a walled and trenched village, with towers at intervals on the walls, situated at the base of a spur from the Lebanon, and has a population of about 500. There is a high square tower in the middle of the village. The ancient port is nearly filled with sand and stones, but it still affords shelter to small coasting vessels, which carry on a considerable trade in tobacco. The landing place is in a small cove northward of the village.

Digitized by Google

Nahr Ibrahim (ancient Adonis), a considerable stream, flows into the sea about 3½ miles southward of Jebeil; it rises in the high mountains of Akura and Afka. The latter source is the scene of the fable of Venus and Adonis, whose tragic end, torn to pieces by a wild boar, gave rise to the popular idea that this river at certain seasons became purple from the blood of the victim; the ruin of a temple marks the spot.

About ¼ mile from the sea the river is spanned by a bridge, over which the road from Beirut to Tripoli passes.

Soundings.—Between Ras Burbara, which is situated about 7½ miles southward of Ras esh Shuka, and Ras Mameltein, the 100-fathom curve approaches in places to the distance of ½ mile from the coast.

Juneh Bay, the port of the northern portion of the Lebanon, lies between Ras Mameltein and Ras et Tir, 1¾ miles south-southwestward, and extends 1 mile east-southeastward. The northern and central parts of the bay are deep, but shoal water with rocky ground extends about ¼ mile off the southern part and Ras et Tir, which is low and shingly. The two conspicuous monasteries of El Ghuzir and Antonio stand on a precipitous spur of a mountain, 1,161 feet high, which nearly reaches the northeastern shore of the bay. Juneh, a large village, is situated on the southern shore of the bay.

Anchorage can be obtained in summer in 4½ fathoms water with Ras et Tir bearing 245° and the customhouse 153°, but large vessels anchor in 8 fathoms, sand bottom, with Ras et Tir bearing about 227° and the customhouse 153°.

The coast from Ras et Tir trends south-southwestward 2¼ miles to Ras el Kelb.

Nahr el Kelb (ancient Lycus), which flows into the sea about 800 yards northeastward of Ras el Kelb, is the largest stream, next to Nahr Abu Ali, on this coast. Northward of the river are several monasteries, situated on conical wooded hills. Mar Yusef el Burj, a fine monastery, is situated on a rocky peak, 505 feet high, on the left bank of the river and 600 yards south-southeastward of the entrance; several Assyrian and Roman bas-reliefs and inscriptions are cut in the cliff in its vicinity, the former dating from 1400 B. C. Good water can be obtained here throughout the year; in summer there is very little water on the bar. During summer there is anchorage off the mouth in from 7 to 9 fathoms, mud and sand, with the water mill bearing about 124°.

Wrecks.—Two wrecks lie sunk in St. George Bay; one, a steamer with stack and two masts above water, lies about 700 yards 85° from Zier-tem Nahr Island; the other, a bark, with masthead above water, lies about 700 yards farther in the same direction, 85° from Zier-tem Nahr Island.

Digitized by Google

Jun Al Khudr (St. George Bay), the shore of which is entirely sand, extends between Ras el Kelb and Nahr Beirut, nearly 4 miles southwestward; it is the usual winter anchorage for naval vessels. The 100-fathom curve approaches the shore of the bay, near the middle, to 1¼ miles, and in the southern part of the bay the water shoals from 20 to 5 fathoms in about 600 yards. Several streams run into the bay.

Nahr Beirut is a small stream in summer, but swells into a river in winter, and is crossed by a bridge of seven arches about 800 yards from the entrance. A sand bank off the mouth of the river dries out to the rock inside Zier-tem Nahr; it appears to be extending, and the river to have made a new outlet.

Zier-tem Nahr is the middle of three rocks above water, which extend northward 400 yards from the western entrance point of the river.

The coast from the western point of Nahr Beirut trends westward 3½ miles to Ras Beirut, and is a succession of small bays and rocky points. Quarantine Point is 800 yards westward of the western point of Nahr Beirut, and from a point 300 yards farther westward a line of rocks above and below water, the outer of which is named Sheshi, extends northeastward 600 yards.

Mark.—About 400 yards southwestward of Quarantine Point and near the gas works is a chimney, 175 feet high, which is very conspicuous.

Beirut (Beyrout) (ancient Berytus) is the most flourishing seaport of Syria.

Aspect.—The town, situated within the coast between Quarantine Point and Ras Beirut, as seen from the sea is most beautiful. An old wall incloses its more ancient part, in which are the bazaars, etc. The extensive suburbs are built on the slope of a terraced hill, and consist of numerous picturesque villas surrounded by gardens. Beyond these the mulberry groves cover the whole acclivity, extending a considerable distance on either side.

The land to the eastward rises suddenly to the height of 2,733 feet about 6½ miles from the town; on the summit here is Mar Ishaya village, with, on the range to the southwestward, Brumana and Beit Meri villages.

The land southward and westward of the town rises in remarkable red hills, about 300 feet high, of drifting sand, which, being blown by the strong southwesterly breezes in summer, is encroaching on the town. The hills are conspicuous from seaward.

Ras Beirut is low, but rises abruptly to the westernmost of the red hills, 332 feet high.

Lights.—A flashing white light is exhibited, at 124 feet above high water, from a yellow stone tower with a white dome, 437 yards within Ras Beirut, visible 16 miles.

Digitized by Google

A light is exhibited from a red stone tower on the extremity of the short arm, extending southward from the North Mole.

A light is exhibited from a signal mast on the northern extremity of the East Mole when vessels are expected. (See Light List.)

Anchorages.—The best anchorage is off the town, in from 11 to 13 fathoms, with the red stone lighthouse on the southern arm of the North Mole bearing 227°, distant 650 yards, and the chimney, 175 feet high, near the gas works, bearing 121°. The greater part of the anchorage is rocky, covered by sand or mud. In winter, during rough weather, in order to avoid the heavy ground swell, the best anchorage is in 36 fathoms water with the red stone lighthouse on the southern arm of the North Mole bearing 170°, distant 1,500 yards. The anchorage is open from west to north, and between November and March, if the strong southwest gales, which are frequent, veer to northward of west in the squalls, be prepared to way and either go to sea or to Jun al Khudr, as the gale will probably shift to the northwestward. Vessels must not anchor within ¼ mile from the North Molehead in the fairway to the harbor.

Vessels lie in Jun al Khudr during winter in about 10 fathoms, with the outer island off Quarantine Point bearing 261°, in comparative safety, with little strain on the cables, owing to a strong offset during northwest and northerly gales, but a very heavy sea rolls in with these winds, and breaks in less than 4 fathoms. The bottom is tough mud, in which the anchor soon becomes buried. It is said that during northwesterly gales there is sometimes a westerly current, causing vessels at anchor to lie with heads to the northeastward.

Harbor.—The harbor is situated within two moles; the North Mole extends 800 yards 78° from Ras esh Shamiyeh, and an arm projects 65 yards 168° from about 60 yards within its outer end; the East Mole, the western side of which is the coaling wharf, extends 350 yards from Ras bei Medawer. The entrance, between the East Mole and the southern arm of the North Mole, is 160 yards wide. There is a depth of 7 fathoms in the entrance, which gradually decreases to 3 fathoms about 100 yards off the southern side of the harbor, and thence to 1 fathom off the quays on that side.

Nearly all steamers, including those of large size, enter the harbor. There being insufficient depth alongside the coaling wharf, vessels of more than 21 feet draft require lighters to be placed inside them. Steamers over 400 feet in length are moored parallel to the North Mole. Smaller vessels are moored close to each other parallel to the East Mole with a hawser astern to a ring bolt or bollard on the main quay, on the southern side of the harbor.

The railroad runs on to the main quay.

Digitized by Google

Beacon.—A stone beacon, painted black and white in horizontal bands, marks a rock, with 1½ fathoms water, 75 yards northward of the eastern end of the customhouse quay.

Mooring buoys.—Three mooring buoys are placed in the northern part of the harbor, about 150 yards apart and 90 to 70 yards from the North Mole, in depths of 5 to 8 fathoms. The moorings are of 2-inch cable, not in good condition; the north leg is secured to eyeblots sunk in the masonry of the breakwater. A starboard anchor must be down when secured to the buoys, head to the eastward. There are other mooring buoys in the southeastern part of the harbor in shoaler water.

Pilots.—Pilotage is not compulsory, but a pilot can be obtained by making the pilot signal. The services of a pilot appear to be unnecessary.

Directions.—From the southward, round Ras Beirut at a distance not less than ½ mile, as a rocky ledge extends 300 yards off Ras el Ghara, its western point, and a strong current generally sets to the northward, which should be guarded against. After rounding the cape, do not anchor until the barracks on the slope of the hill over the town bear 160°, to avoid a deep hole with over 100 fathoms, which approaches to 550 yards from the shore.

At night, when approaching Ras Beirut from the southward, do not shoal the water to less than 50 fathoms until Ras Beirut Light bears 60°, which leads northwestward of the ledge off Ras el Ghara. Then keep in not less than 20 fathoms until the light bears 180°, when steer eastward, and anchor northeastward of the North Mole Light as above directed.

On a vessel approaching the harbor a boat, flying a "Blue Peter" in the bows, will indicate the position to drop the anchor, the distance inside the entrance depending on the position of the buoy to which the stern is to be secured if going into the southeastern part of the harbor, or of the moorings if going into the northern part. Naval vessels entering the harbor should ascertain if there is room.

Landing.—Boats of naval vessels land at the health office steps in the harbor.

Beirut town has wide streets, public buildings, and suburban residences of a European character. The population is estimated at about 150,000.

There is a good German hospital, where patients can be received.

The villages on the western slope of the Lebanon are much frequented by the European and native residents during summer, on account of the cooler air and more bracing climate. Aleih, 7 miles southeastward of Beirut, where there are two hotels, is the most frequented; there is a railroad station here and also a post office and telegraph station.

Digitized by Google

The customhouse, captain of the port's office, and health office are on the southern side of the harbor.

Consul.—The United States is represented by a consul and vice and deputy consul.

Quarantine.—Vessels must not communicate until they have obtained free pratique by sending to the health office.

Time signal.—A time ball is hoisted at the tower of the main building of the American college, situated about 600 yards eastward of Ras Beirut Lighthouse, at 19 h. 55 m. 0 s., and dropped at 20 h. 0 m. 0 s. local time, or 17 h. 38 m. 7.3 s. Greenwich mean time. In case of failure, a blue flag will be hoisted immediately, and the signal will be repeated at 21 h. 0 m. 0 s. local mean time.

Trade.—The imports are chiefly cotton and woolen goods, metals, rice, sugar, leather, petroleum, silk stuffs, coal, coffee, flour, hardware, paper, preserved goods, wines and spirits, timber, tiles, iron and steel bars, sheets, etc., and sundries; and the exports are silk, wool, cereals, oil, soap, dried fruit, cocoons and waste silk, hides and skins, liquorice, and bitumen.

Supplies.—Provisions are obtainable, and good spring water of Beirut Water Co. can be obtained from a hose close to the landing place, where boats can fill their tanks. Water can be supplied in tank boats up to 400 tons daily.

Coal.—About 15,500 tons of coal and patent fuel are imported annually, and there are usually about 4,300 tons in stock. Coaling is performed by lighters of from 10 to 60 tons capacity, of which there are about 30, at the rate of 400 tons a day.

There are two coaling wharves; the outer is about 450 feet long, with 17 to 25 feet alongside, and the inner is 295 feet long, with 6 feet alongside.

Communication.—A railroad runs from Beirut to Rayak, Homs, and Aleppo, and connects with a line to Damascus at Rayak. There is also a light railroad, 12 miles long, to Mameltein; it is being extended to Jebeil. There is a carriage road to Damascus, and the roads in the vicinity of Beirut are very good. There is telegraphic communication.

The coast from Ras Beirut trends southward 13 miles to Ras Damur, and is a long, nearly straight, sandy beach. A well-cultivated rich plain and olive groves extend to the foot of the hills, which rise suddenly. Numerous villages and monasteries, picturesquely perched, dot their sides amidst vineyards and mulberry groves. Within Ras Damur is a remarkable mountain and valley which divides the highland running parallel to the coast.

Nahr el Damur (ancient Tamyras), which flows into the sea 1½ miles northward of Ras Damur, rises in the high mountainous dis-

Digitized by Google

trict of Bhamdun and the higher ranges of the Lebanon, and descends through the Wadi el Kadi, a foaming torrent in winter and during the melting of the snow, but a sluggish stream in summer.

The coast from Ras Damur trends southward, and is a sand beach nearly to Ras Jedra, distant 2½ miles; it then continues southward 2¾ miles to Ras Rumeileh, and becomes more rocky and barren, with a few scattered villages on the tops of the ridges.

Saida (ancient Sidon) is situated on the northwest slope of a rocky promontory nearly 3 miles south-southwestward of Ras Rumeileh, the sandy beach between falling back a little to the eastward.

Nahr el Awali flows into the sea nearly 1.2 miles southward of Ras Rumeileh, and its entrance is marked by plane trees on each side, and also by the surf, which generally breaks on the bar. If watering from the river, there is anchorage in about 9 fathoms water, with the entrance bearing about 100° 900 yards.

Firefly Rock, about 1,400 yards west-southwestward from Nahr el Awali mouth, is a rocky patch with 4¼ fathoms water, 200 yards long east and west and 100 yards wide.

Clearing marks.—Ras Surafend well open westward of Jezireh bearing 200°, leads nearly 300 yards westward, and the whole of Burj al Maisa open eastward of the bridge connecting Kalat al Bahr to the shore, about 191° leads close eastward of the rock.

Jezireh, the southern end of which is situated 550 yards northwestward from the eastern of the rocks forming the ancient port, is ¼ mile long north and south, narrow, and about 20 feet high. A rocky spit with 2 fathoms water extends 250 yards northward, and a similar spit with 1¾ fathoms at its extremity extends 300 yards south-southwestward, from the island.

There are depths of 3¾ fathoms and less water within 300 yards east-northeastward of the eastern point of the island.

Lights.—Two fixed red lights are exhibited from a white house with a red roof, situated 70 yards from the southern end of Jezireh. Visible 6 miles. (See Light List.)

Anchorage.—The usual anchorage for vessels of 15 feet and less draft is in 4 to 5 fathoms, sand, eastward of Jezireh, which affords shelter from west and southwest winds; merchant vessels generally make fast to the island. Large vessels anchor in 6 fathoms, with the southwestern extremity of Burj al Maisa in range with the middle of Kalat al Bahr bearing 186° and the northern end of Jezireh about 249°.

Directions.—When approaching from the westward, Tomat Niha, or Sidon Paps, on the Lebanon Range, bearing 276°, lead direct to the town.

Digitized by Google

When proceeding northward of Jezireh to the anchorage, give the northern end of the island a berth of 600 yards, to avoid the rocky spit extending northward from it.

The southern channel, between the spit off Jezireh and the shallow water off the rocks forming the ancient port, has a clear passage 200 yards wide, with 3¼ fathoms least water. To proceed through from the westward, keep the arch at the northern end of Dabagha (a tannery) just open northward of Kalat el Bahr, 90°, until Ras Rumeileh is open eastward of the small rocky islet eastward of Jezireh, 25°, then steer 50°, and when the western extremity of Kalat al Bahr is in range with the southwestern angle of Burj al Maisa, bearing 181°, steer about 12° to the anchorage.

Saida town.—A substantial wall nearly encircles the town; the streets are narrow and crooked, but the houses are generally well built and spacious. Several khans or large magazines, formerly used for the accommodation of merchants and the storing of their goods, still exist. The largest, a quadrangular structure, having a large court in the center, with chambers all round, belongs to the French consulate.

In the southeastern and highest part of the town is the Burj al Maisa, a citadel surmounted by a ruined tower, said to have been built by Louis IX in 1253; it is conspicuous from seaward.

The suburbs round the town have beautiful gardens and orchards plentifully supplied with water brought from Nahr el Awali. Here the orange, lemon, pomegranate, pear, peach, apricot, and banana flourish. Amidst the gardens numerous foundations of massive structures, with sarcophagi, have been found, and also, immediately outside the Boabet el Taht, several columns of a temple. To the southeastward, on a small rocky eminence, stood the ancient necropolis, or burying ground. Here are numerous marble sarcophagi interred in regular lines, and well preserved.

The ancient port is formed by a low ridge of rocks stretching northeastward, parallel to the shore, from an ancient mole fronting the western side of the town; on the easternmost rock stands the ruined Kalat al Bahr, which is connected to the shore by a bridge. The port, now filled with sand and rubbish, affords shelter to a few small country boats.

The population is about 25,000.

Trade.—Saida exports bitumen, silk, dried figs, oranges, lemons, and cereals, and imports petroleum, sugar, rice, flour, and salt.

Supplies.—Provisions can be obtained. Good water can be procured from Nahr el Awali during calm weather, but the west and southwest summer breezes frequently throw in a heavy swell, which breaks some distance from the shore. There is no coal.

Digitized by Google

Communication.—There is telegraphic communication by land lines.

The coast from Saida trends southwestward 7 miles to a point, and is a sandy bay extending 1½ miles southeastward, with shoal water 1 mile off its greater portion; the coast then trends southward 12½ miles to Sur.

Caution.—As nearly the whole of this coast is fronted by rocks and shoal water, extending 1 mile off in places, it should not be approached nearer than 1½ miles nor within depths of 16 fathoms.

Soundings.—From Saida southward to Ras en Nakura the 50-fathom curve is from 2½ to 5 miles offshore.

Ras Surafend, 9 miles southward of Saida, is a double-headed bluff cliff, and a small islet and several rocks extend ¾ of a mile off it. A narrow plain skirts the coast on both sides of the ras, the hills rising in steep, long, table flats from 400 to 500 feet high, on which are several villages amidst trees.

Ras Abu Sait Reef.—Ras Abu Sait is situated 3¼ miles southward of Ras Surafend. A reef of rocks above water extends southward about ¾ mile from 1 mile southward of Ras Abu Sait, parallel to and ½ mile distant from the shore; it is steep-to, and a heavy surf usually breaks on it.

Mount Hermon (Jebel esh Sheikh), the southern peak of the Anti Lebanon Range, about 30 miles eastward of Ras Surafend, is 9,053 feet high, and its isolated cone, tipped with snow during summer, is conspicuous when open southward of Jebel Rihan, the southern shoulder of the Lebanon Range, about 14 miles westward of it.

Nahr el Kasimiyeh (ancient Leontes) flows into the sea 3 miles southward of Ras Abu Sait, but like all the rivers of Palestine has, during summer, a bank of sand across its mouth. It is the third largest river in Syria, and, rising as Nahr Litany, near Baalbek, soon becomes a considerable stream. After flowing southward nearly 60 miles through the rich plains of the Buka, it rushes through the Lebanon Range in a deep wild gorge, and after passing Kulat esh Shukif (Belfort of the Crusaders) turns westward as Nahr el Kasimiyeh 15 miles to the sea. A stone bridge, with a single arch, spans the river about 1 mile from the coast, and the road from Saida to Sur passes over it.

Sur (ancient Tyre), formerly an island but now a peninsula, on which the town is situated, connected to the land by a sandy isthmus, is low and flat.

Lights.—Two fixed white lights are exhibited from a red stone tower on an old battery at the northwest angle of the town. Visible 10 miles. (See Light List.)

Islets and shoals. Several low islets, surrounded by rocks and shoal water, extend about 1,300 yards northward from the town par-

Digitized by Google

allel to the shore, and thence rocky uneven bottom, with 3¾ fathoms on the outer end, continues 1,300 yards farther north-northeastward.

The islets 1,300 yards from Sur are just awash, and those 900 yards from Sur are from 4 to 6 feet high.

Anchorage.—The anchorage is eastward of the islets and shoals just mentioned, in from 4 to 6 fathoms, sand, as convenient.

Directions.—From the westward, approach with the summit of Mount Hermon bearing 78°. For the anchorage keep the guard-house on Ras Sidin, 2½ miles northeastward of the town, in line with the Litany Gorge and one of the summits of Mount Hermon, 82°, which leads about ½ mile northward of the extremity of the shoals extending from the town. When Nebi el Mashuk, a remarkable white building on a rocky mound, 62 feet high, bears 152°, in a large vessel anchor in 9 to 10 fathoms, sand and weed, or keep this bearing on till the minaret in the town bears 202°; keep the minaret so, and anchor as above directed.

Small country vessels usually enter between the south rock and the northern fort, where there is a passage 400 feet wide, with 2¼ fathoms water, and anchor in the bight eastward of the town, in from 3½ to 4 fathoms, sand. This is considered the most secure anchorage on the coast.

Sur town, which is encircled by an old wall, fast crumbling away, is principally mere hovels, and contains a population of about 7,000; a few of the houses are of a better class, but the streets are narrow and dirty. Confused masses of columns, embedded in the solid rock, and pottery lie strewn in every direction along the western side. On the southern side, without the walls, now the Turkish cemetery, are pits and heaps of rubbish, from which huge green and white marble columns have been brought to light. The remains of a mole extend some distance into the sea, with numerous granite columns along the coast. On the northeastern side of the town are the remains of the moles which inclosed the ancient port; they were constructed of hewn stones of considerable size; little, however, remains, and the port, now filled with sand, only affords shelter to the smallest coasting boats.

The town has but one gate, on the eastern side, and at a short distance outside are two wells which supply the town with water. Massive ruins of towers or walls rise above the drifting sand of the isthmus, which here is 20 feet high.

Supplies.—Beef and mutton can be obtained, but vegetables are scarce. Water is procurable from the water house near the pottery, close eastward of the town.

South Bay.—A line of rocks projects nearly 800 yards southward from the southwestern point of Sur Peninsula, and a spit, with 2¾ fathoms on its extremity, continues about ½ mile farther south-

Digitized by Google

ward. Moles, built on the rocks, once formed a port eastward of them, but now only a few traces of the moles remain; the bay is therefore open to the prevalent southwest winds, and is never used.

Rock.—A rock with 1½ fathoms water lies 700 yards westward of the extremity of the spit above mentioned; it is the northern part of a bank which, with from 3¾ to 5 fathoms water, extends southward ½ mile. Ras Surafend, or the outer northern rocks, well open westward of the northwest extremity of Sur Peninsula, about 26°, leads westward of the bank; at night do not shoal the water to less than 18 fathoms until the lights bear eastward of 28°.

The coast from Sur Peninsula trends southward 6¼ miles to Ras el Abiad, forming a bay which extends about 1½ miles eastward.

Tel Habeish.—There is an artificial flat quadrangular hill, about 10 feet high, about 2¼ miles south-southeastward of the southwestern point of Sur Peninsula and ¼ mile inland; on its summit is a remarkable square building, intended for a khan, but now deserted. Here once stood ancient Palætyrus. Copious streams flow into the sea hereabouts, and work several water mills.

Ras el Ain (the Fountain Head), so called from numerous springs, lies in the plain nearly ½ mile southward of this hill. Two of the springs are inclosed by massive masonry, which raises the water considerably above the plain. An aqueduct of Roman architecture 4 miles long conveys the water thence to Sur town.

Ras el Abiad (ancient Promontorium Album) is a bold white cliff, the termination of Jebel Belat Range, 2,552 feet high, situated 6½ miles east-southeastward, on which are the remains of a very ancient temple, with several columns still standing. Idmid, 1½ miles southeastward of the ras, is a remarkable conical table-topped hill, 1,251 feet high, and Kulat Shemma, 1 mile farther eastward, is a similar hill, 1,408 feet high; on these hills are conspicuous villages built within the walls of an ancient fortress.

The coast from Ras el Abiad trends southwestward 5½ miles to Ras en Nakura, and is rocky and bold.

Ras en Nakura (ancient Scala Tyriorium, the Tyrean Ladder) is a bold promontory with a round tower on its summit, and is the termination of Jebel Mushakka, the southern side of which descends abruptly to Akka Plain. The ras is 261 feet high, and the land rises gradually to a remarkable round-topped hill, 1,070 feet high, 3 miles to the eastward.

Akka Plain, situated between Jebel Mushakka on the north and Mount Carmel on the south, is about 20 miles long and 5 broad; it is studded with numerous villages and is most fertile. The land eastward rises gradually to a mountainous range, and Jebel Jurmuk, its highest peak, situated 16 miles east-southeastward of Ras en Nakura, is 4,000 feet high.

Digitized by Google

The coast from Ras en Nakurda trends southward 10½ miles to Akka, and is sandy beaches, with a few rocky points.

Rocks.—From about ¾ mile south-southwestward of Ras en Nakura a rocky patch extends southward 1 mile, and ½ mile offshore, with 5 fathoms water in the channel between; there is a small islet on the southern end of the patch. A rocky patch, with an islet on it, lies about ½ mile off Zib village, which is situated on the coast 2¾ miles southward of Ras en Nakura, and is marked by its minarets. Thence patches of rocks with from 2½ to 4½ fathoms extend 5¾ miles southward, parallel to and distant 1 mile from the shore; there is a patch with 2¾ fathoms water about 600 yards offshore 5 miles southward of Zib. The 100-fathom curve approaches the northern of these patches to about 1 mile, but it is about 6 miles distant from the southern patches. The coast should not be approached nearer than 2 miles nor the water shoaled to less than 15 fathoms.

Bay of Akka or Acre.—The town of Akka or Acre is situated on a peninsula which projects about 800 yards southwestward from the plain; the Bay of Akka lies between the peninsula and Ras el Krum, 6½ miles southwestward, and extends 3 miles southeastward.

Light.—A fixed red light is exhibited, at 51 feet above high water, from a white tower, 33 feet high, on the rampart southward of Akka town. Visible 10 miles. (See Light List.)

Shoals.—Several shoals lie westward of Akka Peninsula. A rock with 11 feet water lies 400 yards south-southwestward from the lighthouse; there are depths of from 18 to 30 feet for ½ mile farther south-southwestward.

Vernon Reef extends northward nearly 1¼ miles from about 1 mile westward of the lighthouse, and has depths of from 25 to 33 feet, the least water being 1,200 yards from its southern end.

Talbot Reef extends south-southwestward about 1,800 yards from about 1½ miles westward of the lighthouse, and has depths of from 27 to 33 feet. There is a clear passage, ½ mile wide, with depths of from 42 to 72 feet between Vernon and Talbot Reefs.

A shoal with 25 feet water lies about 1¼ miles south-southwestward from the lighthouse. The British naval Vessel *Foxhound* is stated to have found 3 fathoms on the shoals, but a close examination by the British naval vessel *Surprise* failed to find a depth less than 25 feet. The north part of the west wall a little open westward of the southern part of the wall, bearing about 23°, leads westward of the shoal.

Outer anchorage.—Large vessels usually anchor, in from 9 to 10 fathoms, about 1 mile southwestward of the lighthouse and eastward of Talbot Reef, with the end of the West Mole bearing 50°, and Ras en Nakura 13°. The end of the West Mole bearing 50° leads southeastward of Talbot Reef and the the anchorage.

Digitized by Google

Inner anchorage.—Small vessels usually anchor in 33 feet, sand, southeastward of the lighthouse, with Manara (East Molehead) in range with the eastern white bastion bearing 18° and the lighthouse 308°; Manara in range with the bastion leads to the anchorage, passing between the shoal, with 25 feet water, about 1¼ miles south-southwestward of the lighthouse, and the beach.

Ancient port.—On the eastern side of the town the remains of the moles which formed the ancient port are still visible; these give shelter to small coasting vessels, but it is very shallow and fast filling up. Manara is the name of the molehead, on which once stood a small battery.

Akka or Acre town is defended by massive fortifications on all sides; the land side having a deep fosse and double rampart. The town is desolate and dirty. Ruins of massive buildings exist and mark the effects of the numerous sieges the town has experienced, and the bombardment in 1840, when a powder magazine exploded and laid it in ruins.

Trade.—Grain from the Hauran, sesame seed, and olive oil are the principal exports.

Supplies.—Provisions can be obtained; the bazaars are narrow and small, but well supplied with vegetables. Good water can be procured from the Beirut Water Co.

Coal.—About 200 tons were imported for private use in 1897; there is no later information.

Communication.—There is a railroad from Akka to Haifa.

The shore of the bay between Akka and Haifa is sandy, with low sand hills near the sea; within about 1 mile eastward of Haifa there are many palm trees and gardens. The 5-fathom curve, within which the water quickly shoals, is from 600 to 1,000 yards offshore.

A bank with 5 and 4¾ fathoms water extends, about 1¼ miles offshore, from 2.2 miles to 3 miles south-southwestward of Akka Peninsula.

Nahr el Mukata (River Kishon).—The tributaries of this river rise near Jebel Tur (Mount Tabor), 21 miles east-southeastward of Haifa, and Mount Gilboa, 27 miles southeastward of Haifa, and flows through the great Esdraelon Plain, uniting about 15 miles from Haifa. The river receives other tributaries from each side, but these as well as the river usually dry in summer, and the only water which permanently flows to the sea is received from numerous springs on the eastern slopes of Mount Carmel, where the river assumes a very tortuous course and enters the sea 1½ miles eastward of Haifa. The water is brackish and unsuitable for domestic purposes. The mouth of the river is shallow and a heavy surf usually breaks across the bar.

Digitized by Google

Haifa or Khaifa (ancient Sycaminum) is situated on the southwestern shore of the Bay of Akka on one of the spurs of Mount Carmel.

Light.—A flashing red light is exhibited from a white mast surmounting a tower of the old castle on the shore in front of the town, visible 6 miles. (See Light List.)

Marks.—A solitary sand hill, 30 feet high, 1.15 miles eastward of the railroad pier; a factory, with a black chimney, about ½ mile eastward of the same pier; and a large four-storied house, with a red roof, near the top of Mount Carmel, about 1,600 yards southwestward from the town, are conspicuous. A large iron building was erected in 1913 on the railroad pier.

Anchorage.—There is safe anchorage off Haifa during summer, in about 36 feet water, sand, with the end of the railroad pier bearing 207°, distant about 1,200 yards, and the extremity of the land southeastward of Ras el Krum 299°, or in about 45 feet water with the end of the railroad pier bearing 188°, distant about 1 mile. At night caution is necessary in approaching the anchorage, as coasting vessels frequently anchor about ½ mile offshore, and do not carry anchor lights.

Haifa town is oblong in shape; the houses generally are built of stone, and the streets are narrow, and during the rainy season become rivers of mud and filth. There is a tolerably large settlement of Germans here; they have contributed largely to the rising prosperity of the place, and their houses, which are surrounded by good gardens, are on the west side of the town. The population of Haifa is about 30,000.

Consul.—The United States is represented by a consular agent.

Piers.—The railroad pier, eastward of the town, extends northward 380 yards, with a width of about 50 yards; there is a depth of 12 feet at its end, which is in bad condition, and should be avoided by steamboats. There are two cranes on the pier, the larger of which will lift 2 tons. The best landing in smooth water appears to be on the eastern side of the pier inside the coal store.

The town pier, just westward of the railroad pier, is almost destroyed, only the root remaining, alongside which there is not sufficient water for steamboats; approach to it is dangerous owing to the presence of pieces of iron. The bay between the railroad and town piers is rapidly filling up.

There is a small stone pier ¾ mile northwestward of the castle.

Trade.—The exports consist of cereals, sesame, olive oil, soap, wine, charcoal and hides. There is a soap manufactory and flour mills.

Supplies.—Meat, vegetables, and bread are plentiful. Fish can be obtained in large quantities by use of the seine, and turtle are

Digitized by Google

often very numerous about here. Good water is procured from wells in the gardens outside the town. The water supplied in casks is brackish.

Coal.—About 20,000 tons of coal are imported annually for the Hedjaz Railroad Co., which keeps about 5,000 tons in stock, but the amount varies; another firm keeps about 400 tons in stock. There are 26 lighters of from 12 to 20 tons, and 22 of from 20 to 50 tons, also one tug. From 150 to 200 tons can be loaded in 24 hours. There is no coal wharf.

Communication.—There is a railroad to Akka, and also the Hedjaz Railroad to Damascus. There is telegraphic communication by land lines.

The shore of the Bay of Haifa trends northwestward 1½ miles from the town to Ras el Krum. The 3-fathom curve is from 300 to 600 yards off it.

Ras el Krum is the northern end of the flat plain extending from the base of Mount Carmel. A stone windmill stands about 400 yards southward of the ras. The ancient Sycaminum was probably situated on the plain southward of the ras.

The coast from Ras el Krum trends west-southwestward 1½ miles to Tell es Semakh, a remarkable low peak, and shoal water extends northwestward from it to Spartan and Carmel Reefs.

Cape Carmel, nearly 1 mile west-southwestward of Ras el Krum, is the northwestern extremity of a fine bold promontory. The Convent of St. Elias is situated about 500 yards and Mount Carmel Lighthouse about 300 yards within and near the summit of the cape.

Light.—A fixed and flashing red light is exhibited, at 490 feet above high water, from a white stone tower about 200 yards north-northwestward of St. Elias Convent. Visible 30 miles. (See Light List.)

Mount Carmel, so named from Carmel, "the park or fruitful field," is a table ridge extending 12 miles southeastward from the cape, and attains a height of 1,861 feet. El Mohraka, the southeastern peak of the ridge, is the supposed site of Elijah's sacrifice and also the confusion of Baal's prophets.

Spartan Reef, a patch with 2¾ fathoms least water and from 3 to 4½ fathoms around, lies nearly 1 mile northwestward of Ras el Krum; the water to the northward deepens gradually to 15 fathoms, sand.

Carmel Reefs, 1 mile west-southwestward of Spartan Reef, are several rocky heads with from 2½ to 5 fathoms water extending nearly 1½ miles north-northwestward from Tell es Semakh. The water northward of the reefs gradually deepens to 15 fathoms, sand, but to the westward it deepens quickly to 12 fathoms.

Digitized by Google

Directions.—Athlit high ruined tower open eastward of Khushmid Maher 181°, or the extremity of land to the southward, 181°, leads westward of Carmel Reefs. Akka Citadel in range with the south peak of Jebel Sasa, bearing 66°, leads 1½ miles northward of Carmel and Spartan Reefs. When the town of Haifa is open eastward of Ras el Krum, steer for the anchorage. The southern extremity of the town of Akka in range with the southern part of Mount Hermon, 61°, also leads about ½ mile northward of the reefs.

At night, from the southward, when rounding Carmel and Spartan Reefs, do not shoal the water to less than 18 fathoms until the light at Akka bears 61°; keep the light on that bearing, and when Mount Carmel Light bears 158°, steer eastward until that light bears 211° and the light at Haifa 171°, when steer southeastward for the anchorage.

The coast from Tell es Semakh trends southward and is a sandy beach, 7¼ miles to Athlit; ledges of rocks with 4½ to 5 fathoms water run parallel to the beach, and nearly 1 mile offshore, the greater portion of the distance.

Athlit (ancient Castellum Peregrinorum) stands on a rocky promontory, having on its southern side a small bay open northwestward, which was the ancient port. Extensive ruins encircle the miserable village situated among massive foundations and vaulted substructures of the time of the Crusaders, the Gothic and groined arches still remaining complete. A high square tower, 109 feet above the sea, is conspicuous.

The coast from Athlit trends southward nearly 6 miles to Tantura and is rocky with small sandy bays; there is a low rugged ridge on which are Surafend and Kefr Lam villages, about ½ mile inland. Tantura (ancient Dor) is a small village of some 30 houses, situated on the sandy beach inside some black rocky islets. On a rocky mound northward of the village are the foundations of massive buildings; a tall pillar on the summit of the mound is fast crumbling away, but is conspicuous; here are rock tombs, fragments of columns, and mounds of rubbish.

On the south side, inside the islets, was the ancient port, where boats now shelter off the village.

The coast from Tantura trends southward, and is a sandy beach, 6½ miles to Kaisariyeh; Hammam Islet, close off the beach, 3½ miles from Tantura, is small, black, and rocky. Within the beach is a partially cultivated plain abutting Khushmid Maher, which is a cliffy table-topped hill, 457 feet high, with a tree on its summit, situated 4½ miles southward of Tantura and 1½ miles inland; from this hill a ridge trends southeastward, and southward of it is the great plain of Sharon.

Digitized by Google

Kaisariyeh (ancient Cæsarea) was once the capital and principal seaport of Palestine. The ancient port is now filled, and the immense moles constructed by Herod the Great do not exist. Nothing now marks the site of the moles which, according to Josephus, inclosed a space nearly equal to the Piræus of Athens. The ruins of a fortress on the southern side of the ancient port alone mark the spot that appears to have been part of the mole. A little to the northward are numerous granite columns in the sea, the ruins of a landing place, and from these columns the ruins of an ancient mole, awash in places, extend 300 yards northwestward. A double aqueduct runs northward, and the arches are visible above the sand drift. A fortress of a quadrilateral form, with towers at regular intervals, inclose a mass of ruins.

Near the middle of the small shingly bay are the remains of a Christian Church, the buttresses of which still stand and from a distance have the appearance of pillars. Farther southward, outside the present fortress, is the probable site of one of its theaters, but only its circular form remains. The ancient city extended far beyond the present inclosed quadrilateral columns, and portions of foundations, evidently of walls, but now overgrown with bushes, mark its contour; the site is plowed over and sown at certain seasons by the Bedawin.

Anchorage.—There is anchorage about ½ mile off Kaisariyeh, in 10 fathoms, sand, during summer.

The coast from Kaisariyeh trends south-southwestward 28 miles to Yafa, and is red cliffs, with a sandy beach at their base, but for about 2 miles northward of Yafa it is undulating sand hills, 40 to 50 feet high.

Arsuf (ancient Apollonia), on the coast 19 miles from Kaisariyeh, is situated on a conical hill within the cliff, and marked by one minaret. About 1,200 yards southward is the Nebi el Haram, white and conspicuous; only a few ruins, with the traces of a small fort at its base, remain.

Abd en Nebi, a ruined building of yellow stone, 89 feet above the sea, lies on the coast about 7 miles southward of Arsuf.

Yafa (Jaffa)—Light.—An alternating revolving white and red light is exhibited, at 69 feet above high water, from a low quadrangular tower surmounting a white dwelling in the southwestern part of the town, about 100 yards inland; the lighthouse is not noticeable. Visible 14 miles. (See Light List.)

Anchorage.—There is anchorage in about 10 fathoms, with the French Convent bearing 168°, 1¼ miles, and in from 8 to 10 fathoms, with the convent bearing 93°, 1,400 yards, or between these positions. The best position is in 7 fathoms, with the convent bearing 116° 1,200 yards.

Digitized by Google

The anchorage is very uncomfortable with westerly winds, which send in a heavy swell and are accompanied by a current setting northward at a rate of from 1 to 1½ miles an hour; vessels then roll heavily, and it is advisable to go to sea until the swell goes down.

The best anchorage at Yafa is in 7 fathoms, with the lighthouse bearing 127°, 1,150 yards. The lighthouse is set low down among other buildings and may easily be mistaken for a tower of similar size and shape farther northward, especially when approaching the town from the northward.

Tides.—It is high water, full and change, at Yafa at 10 h. 0 m.; springs rise 1½ feet.

Yafa town (ancient Joppa or Japho) has occupied an important position at all periods of its history, it being the seaport of Jerusalem, from which it is 30 miles distant.

The town is situated within a wall on a conical hill, about 150 feet high, and its whitewashed stone houses, together with the tower of the French Convent, which has a flagstaff surmounted by a cross, are conspicuous; but it is not now accurate. The spire of the Russian Church is conspicuous from the westward; it is situated behind the town and can not be seen from the anchorage. A minaret about 400 yards eastward of the French Convent is also conspicuous; near the minaret is the municipal hall, a building with a tower and a spire surmounted by a Turkish crescent.

The population of the town is about 55,000.

Boat harbor.—The harbor (the ancient port) is situated between a sea wall on the northwestern side of the town and a fringe of low rocks, and has depths of from 3 to 7 feet, the width varying from about 50 to 100 yards. The entrance is northward of the rocks, and there is also a passage between the rocks about 500 yards from their northern end. Within the passage is the customhouse, and a short jetty having steps at its end and sides; there is also a short wharf southward of the customhouse where lighters land their cargoes in smooth water.

In winter communication with the town is often stopped for several days together; steamers then land their passengers at Haifa.

In bad weather it is preferable to employ native boats for landing; they are said to be well built and skillfully managed.

Trade.—The exports are principally fruit (oranges and watermelons), grain, sesame, soap, wines, and spirits; the former, owing to the rich gardens surrounding the town, is abundant. The imports, coal, cotton manufactures, coffee, rice, salt, sugar, flour, petroleum, hardware, iron and ironwork, cloth, and timber.

Supplies are cheap and abundant; water is supplied from springs and wells, but it is difficult to obtain.

Digitized by Google

Coal.—About 7,300 tons of coal and patent fuel are imported annually, and about 3,000 tons are usually in stock; coaling is performed by lighters, of which there are 30 of about 8 to 10 tons each, and coal can be put on board at the rate of about 500 tons a day.

Communication.—There is a railroad to Jerusalem, the trains taking about 3½ hours, and telegraphic communication with Europe and Egypt. The caravan route from Beirut, Saida, Haifa, and Kaisariyeh passes through Yafa.

Barometer.—According to observations made during the years 1880–1889, inclusive, the mean annual height of the barometer at Sarona, about 2 miles northeastward of Yafa is 29.85 inches; the mean monthly height in July and August, the lowest, is 29.68 inches, and in January, the highest, 29.96 inches.

Thermometer.—The mean annual temperature is 67°; the mean monthly temperature in January, the lowest, is 54½°, and in August, the highest, 78¾°.

Rainfall.—The mean annual rainfall is 21½ inches; of this amount 18 inches fall from November to February, inclusive. The most rain falls in December and January.

Plains of Sharon and Philistia extend from Khushmid Maher to Ghuzzeh, about 70 miles to the southward, and to the base of the mountains of Samaria and Judea, from 8 to 12 miles inland; they are rudely cultivated cornfields and pasture lands. The plain of Sharon extends from Khushmid Maher to Yebna; that of Philistia from Yebna to Ghuzzeh.

The mountains rise from these plains in gentle slopes, the main ridge being about 25 miles inland and from 2,000 to 3,500 feet high. The slopes are studded with numerous villages, while the principal summits are crowned with nebis (tombs), the most conspicuous being Um el Fahm, 13½ miles eastward of Kaisariyeh; Mounts Ebal, 3,375 feet high, and Gerizim, 3,179 feet high, with Sleiman el Farsi, 2,893 feet high, about 22 to 24 miles eastward of Arsuf; Nebi Samwil (ancient Mizpeh), 3,193 feet high, 4 miles northwestward of Jerusalem; Dahar el Salah, 3,430 feet high, 7½ miles southwestward of Jerusalem; and Nebi Nuh, 2,911 feet high, 26 miles east-southeastward of Askelon; the mountain ridge descends abruptly to the plain from the last-mentioned peak.

The coast from Yafa trends south-southwestward 26 miles to Askelon, and is sand hills, interrupted by a few black rocky capes. There is a white minaret, surrounded by a building, 6½ miles southward of Yafa and ¾ mile inland.

Yebna.—Some rocky islets extend parallel to and about 200 yards off the shore 8 miles from Yafa. On the mainland within the southern extremity of the islets is a massive masonry work (evidently Roman),

Digitized by Google

from 15 to 20 feet in height, in ruins, which appears to have been a small fortress; masonry blocks of a similar type extend above the drift sand more than ½ mile to the northward, running along the coast ridge; there is an ancient well on the slope of the hills. These ruins indicate that a town or scala existed here, and the site is probably that of the port of Yebna.

Nebi Yunas.—About 7 miles southward of Yebna, on the southern side of Wadi Sumt, is a conical white sand hill, 188 feet high, surmounted by Nebi Yunas, a conspicuous building.

Askelon (ancient Ascalon).—This ancient city was built in the form of a theater, with the two horns abutting on a line of bold cliffs, which rises to the height of about 60 feet directly from the sea; but little of the city now remains.

The walls, which are still visible along the circular ridge, are lying in huge confused masses; near the highest point is a nebi or tomb on the top of a sand hill. Within the inclosed space are gardens and thick foliage; the beds of onions, as of old (the eschalot was first grown here and named after the city), still flourish luxuriantly.

The small modern village is outside the ancient walls, amidst mulberry trees, but around all is sand.

Anchorage.—There is summer anchorage off Askelon, in 10 fathoms, sand, but it is open to the westward.

The coast from Askelon trends southwestward in a slight curve 48 miles to El Arish, and is a sandy beach, with sand hills at intervals surmounted by nebis; there are a few trees and shrubs southwestward to Ras el Markhab, where vegetation near the coast ceases.

Ghuzzeh town (ancient Gaza) lies 10 miles south-southwestward of Askelon and about 2 miles inland; it is separated from the coast by hills of drifting sand, 200 feet high; a few of the high minarets of the town can be seen from seaward. The population is about 30,000.

Sheikh Arduan is a remarkable white building on a peaked sand hill, 214 feet high, about 1¼ miles north-northwestward of Ghuzzeh; there are a few trees around. On the beach west-northwestward is a nebi with two domes.

Montar Hill, about ¾ mile south-southeastward of Ghuzzeh, is 314 feet high, and surmounted by a nebi; from a distance westward it shows as a flat table island in the sandy desert.

Anchorage.—The usual anchorage is in about 10 fathoms, sand, with the two white domes of En Nesleh, which are situated on the coast westward of the town, bearing about 118°, distant 1½ miles. The cargoes, principally grain, for vessels at the anchorage are taken off in large boats. From the open situation and the almost constant heavy surf which rolls in from the westward, many weeks are frequently occupied in loading a vessel.

Digitized by Google

Tell Ajur, 102 feet high, surmounted by a ruin, lies 6 miles southwestward of Ghuzzeh and on the southern side of the entrance to Wadi Ghuzzeh, which is the southern boundary of the plain of Philistia.

Ras el Markhab, 6½ miles southwestward of Tell Ajur, is the southernmost green place on the coast; the ridge inland rises to a height of some 500 feet; there are a few palm trees and Nebi Beni Ismaileh on the summit.

Khan Yunas, 2 miles east-southeastward of Ras el Markhab, is a village surrounded with gardens and verdure; a solitary palm here is conspicuous.

The coast from Ras el Markhab to El Arish is white sand hills between 200 and 300 feet high, within which is an undulating desert. There is no vegetation near the sea.

Anchorage has been obtained with the palm at Khan Yunas bearing 83°, distant 5½ miles, and about ¾ mile offshore.

A solitary tree is situated on the summit of a sand hill 17 miles southwestward from Ras el Markhab.

El Arish.—See page 522.

Soundings.—Between Cape Carmel and El Arish, a distance of 121 miles, the water shoals gradually within the 50-fathom curve, which from 5 miles off Cape Carmel gradually increases its distance from the land until off El Arish, where it is 18 miles from the coast.

Current.—The current on the coast of Syria generally sets northward, and its rate is greatly increased by the southwesterly winds which prevail in May and June.

The country vessels proceeding southward frequently anchor off the coast between Cape Carmel and El Arish during summer when the current is strong and the wind light.

39148—16——39

Digitized by Google

Digitized by Google

APPENDIX I.

Particulars of dry docks, patent slips, etc.

Port.	Name of dock.	Length.		Breadth of entrance.	Depth at L. W. O. S.		Lifting power.	Date built.	Springs rise.
		On blocks.	Over all.		On sill.	On blocks.			
		Feet.	*Feet.*	*Feet.*	*Feet.*	*Feet.*	*Tons.*		*Feet.*
Alexandria.	Gabari	500	520	64	22	22	.....	1904	1
Port Said..	Floating	.....	294½	60½	21½	18	3,000	1904	1½
	Patent slip No. 1	[1] 150	([2])	([2])	([2])	([2])	300	.....	1½
	Patent slip No. 2	[1] 150	([2])	([2])	([2])	([2])	300	.....	1½
Piræus.....	No. 1	474	494	79½	29½	28 11/12	.....	.....	.....
		492	512	([2])	.....	.....	.....	.....	.....
	No. 2	331	351	46 11/12	25 11/12	25 7/12	.....	.....	.....
		349	369	([2])	.....	.....	.....	.....	.....
	Patent slip (Bassiliade's Works).	[1] 336	.....	.....	Forward	16	3,500	1907	.....
					Aft.....	21			
Salamis....	Government floating	.....	311	59	.....	21	3,000	1885	.....
Syra.....	Patent slip (Forges et Chantiers Co.).	[1] 314	.....	.....	Forward	12	2,500	.....	.....
					Aft.....	16			
	Do	[1] 180	.....	.....	Forward	10	600	.....	.....
					Aft.....	14			

[1] Cradle.
[2] Particulars unknown.
[3] Caisson in outer stop.

Digitized by Google

APPENDIX II.

List of principal ports, showing particulars of depths, etc.

Port.	Depth at L. W. O. S. in channel of approach.	Depth at L. W. O. S. in anchorage.
Acre	Deep water	10 to 5½ fathoms.
Alexandretta	do	13 to 6 fathoms.
Alexandria	35 feet	11 to 5 fathoms.
Do	do	25 to 39 feet.
Beirut	Deep water	11 to 36 fathoms.
Beirut Harbor	7 fathoms	7 to 3 fathoms.
Benghazi	Deep water	9 to 10 fathoms.
Famagusta	do	17 fathoms.
Do	7 fathoms	7 to 3 fathoms.
Do	26 feet	15 to 24 feet.
Haifa	Deep water	33 to 45 feet.
Karaghatch Harbor	do	10 to 25 fathoms.
Larnáka	do	12 to 18 fathoms.
Latakiya	do	8 to 10 fathoms.
Libia	do	17 to 7 fathoms.
Libia Harbor	3½ fathoms	4 to 5 fathoms.
Limasol	Deep water	7 to 12 fathoms.
Marmarice Harbor	do	7 to 20 fathoms.
Marsa Matruh	16 feet	24 to 47 feet.
Mersina	10 to 6 fathoms	6 fathoms.
Nauplia	Deep	7 to 9 fathoms.
Piræus	15 fathoms	4½ fathoms.
Port Mudros	East Pass, 12 fathoms. Middle Pass, 6 fathoms West Pass, 4 fathoms.	4 to 10 fathoms.
Port Said	33 feet	31 feet.
Port Sigri	11 to 20 fathoms	7 to 14 fathoms.
Rhodes:		
Tershaneh	8 feet	18 feet.
Southern Harbor	22 feet	10 fathoms.
Summer anchorage		12 to 10 fathoms.
Saida	Deep water	4 to 6 fathoms.
Saloniki	26 feet	16 to 25 feet.
Smyrna	7 to 10 fathoms	5 fathoms.
Suda Bay	12 to 20 fathoms	13 to 16 fathoms.
Sur	Deep water	10 to 3½ fathoms.
Syra	17 to 21 fathoms	6 to 10 fathoms.
Syria	Deep water	7 to 3½ fathoms.
Yafa	do	10 to 7 fathoms.

Digitized by Google

INDEX.

A.

Page.

Abbas Hilma..... 514
Abd el Ali..... 455
—— —— Sidi..... 455
—— en Nebi..... 605
Abgo Islet..... 126
Abiad, Ras el..... 599
Abu Jerab..... 486
Abukir Bay..... 507
—— village..... 508
Abu 'l Faris Islet..... 585
—— Saida..... 462
—— Sait Reef, Ras..... 597
—— Shaiba Reef..... 469
—— Sheifa..... 458
—— —— Marabut..... 459
—— —— Marsa..... 458
Abusir Castle..... 488
—— Hill..... 487
—— Reef..... 488
Abu Takra Marabut..... 468
Acamas Promontory..... 555
Acanthus..... 186
Acre, Bay..... 600
Acro-Corinthus..... 103
Acro-Nauplia..... 81
Acropolis. 65, 81, 97, 112, 129, 187, 270, 303
—— of Zarax..... 79
Adalia, Gulf of..... 542
—— Harbor..... 544
Adasi. *See* proper name.
Adelphæ Islets..... 257
Adelphia Rocks..... 232
Adelphi Islands..... 169
—— Islets..... 353
—— Pulo..... 169
Admiralty Picket House..... 387
Adolo Point..... 181, 182
Adramyti, Gulf of..... 368
—— town of..... 369
Adramyttium..... 369
Adratchan Bay..... 542
—— Mount..... 542
Adrian, Ras..... 474
Adu Sha Jebel..... 463
Ædipsos Gulf..... 145
Aegean Sea, general remarks..... 29

Page.

Ægilia Island..... 75
Ægina..... 97
—— Gulf of..... 94
—— Island..... 100
—— peak..... 100
—— port of..... 100
Æsyme, village of..... 188
Afka Mountain..... 590
Age Latha..... 265
Agemi Islet..... 488
Aggria Bay..... 326
Aghaliman..... 549
Agrash, el..... 488
Agria Grabusa..... 76, 410
—— Livadia..... 294
Agrielaia Island..... 537
Agrillia, Cape..... 380
Agrilithi Port..... 256, 257
Agia Elena Point..... 165
—— —— Rock..... 165
—— Kyriaki..... 257
—— Marina..... 147
—— Matrona..... 291
—— Nicholas..... 158
—— Pandelemona Bay..... 358
—— Pnevma..... 412
—— Triada..... 147, 438
—— Varvarah Islet..... 265
—— —— Islands..... 256
Agios Andreas..... 259
—— Antonios..... 261, 428
—— Elias..... 258
—— Georgio Point..... 252
—— Georgios..... 306, 349
—— —— Islands..... 353
—— Ioannis Islands..... 258
—— —— cupola..... 329, 331
—— —— Islet..... 103, 252, 257, 361
—— Kyrkoes..... 443
—— Kyrkos Bay..... 444
—— Menas Island..... 304
—— Milianos, Cape..... 245, 246
—— Nikolo Islet..... 240
—— Sostis Bay..... 411
—— —— Cape..... 148
—— Theodoros, Cape..... 251
—— Thoma, Islet..... 103

Digitized by Google

	Page.
Agnontias Harbor	166
Agnussi	316
—— Reef	316
Agonia Bay	166
Ahal Rocks	481
Aiak Adasi	268
Aiasmata Bay	314
Ain Agagna	465
—— ras el	599
Aird Shoal	392
—— Shoals	390
Aivali Bay	366
—— town of	364
Ajano Island	363
—— Port	363, 364
Ajemi, fort	487
Ajur, tell	609
Akaba es Sollum	482
Akako Point	223
—— Rock	213
Akamatis, Cape	210
Akbuk Bay	279
—— Cape	279
Akbuki, village	301
Akherdo Point	96
Akhili, port	156
Akhiropietos Head	569
Akio Islet	127
Akjadah	322
Akka, Bay of	600
—— citadel	604
—— Plain	599
—— town of	600
——, jebel	586
Akkra, jebel	581
—— ranges	580
Akra Point	139, 140
Akramytis	248
—— Mount	241
Akrathi Islets	196
Akritsa, Cape	143, 144
—— Light	143
Akroteri, Cape	212
Akrotiri	415
—— Cape	398
—— Bay	558
Akrotirion, Cape	237
Akrotiri Peninsula	557
Ak Su	572
Akte, Peninsula of	181, 184
Aktei Bay	446
Akura Mountain	590
Alago Island	374
Alaguni Bay	299, 300
Alakishli Bay	281
Alanguli Cape	300
Alatas Island	160
Alaya Anchorage	546
—— town of	546
Alazo Nisi Rock	304
Aldridge Rock	390, 393
Aleih	593
Alem Ghomed	482
Aleppo	571
—— town	576
Alewan, Mount	339
Alexandretta	576–578
—— Bay	576
Alexandria, coal, repairs, supplies	505
—— eastern harbor	506
—— Harbor	488
—— —— mooring buoys	497
—— —— regulations	501
—— —— works	499
—— new port	506
—— police	503
—— quay and berths	499
—— signals	504
—— the city	503
—— tides	501
—— Traos	383
—— Troas	386
Alexandro	89
Alexi Point	159
Al Hamama, Ras	476
Al Hilil Marsha	477
—— Ras	477
Ali-Agha, port	352
—— Burnu	365
—— Jebel	464
Aliki, Cape	397
—— port of	115
—— River	298
—— Rocks	116
Alimnia	248
—— Island	248
Alinda Bay	291
Ali Ras	463
—— Sidi	448
Aliveri Bay	129
Allem Dauhr, Ras	480
—— Milhr, Ras	480
Alma Dagh	571, 579
—— —— Range	580
Al Milhr, Ras	482
Almiros Bay	158
—— Point	159
—— River	158

Digitized by Google

	Page.
Alogo Point	217, 218
Al Susa, Ras	476
Altin Sevresi	279
Aluntha Islet	307
—— port of	307
Alupo, Cape	263, 525
Amaid, el	487
Amaliopolis	157
Amanei Mountains	308
Amanicæ Pylæ	574
Amaridi Dry Rock	226
—— Rocks	226
Amathus	559
Ambelaki Bay	109
Amista, Cape	307
Ammos Point	186
Amorgos	230, 231, 232, 234, 290
—— Island	229
Amorphos	249
—— Bay	250
Ampelos, Mount	342
Amphipolis	187
Amyno Point	202
Anamur, Cape	542, 547
Ananes	195
—— Islets	195
Anaphi	234, 240
—— Island	239
Anapodari River	436
Anapomera, Cape	308
Anatoli Patch	382
—— Patches	382
Anavadi Rock	223
Anchorage Bank	237
Andemaki Point	261
Andonis, Cape	97, 102
Andraki River	540
Andreas, Cape	567, 569, 570
Andriami Bay	160
Andros Island	136, 138, 209
—— —— northwest coast	137
—— —— currents	138
—— —— winds	137
—— town of	210
Anedro	234, 296
—— Islet	295, 296
Angarlestro Point	120
Angeuko Bay	349
Anghistri Point	158
Angistri Island	98, 101
—— Pass	101
Anghistri Point	159
Angistro, Cape	533, 535
Anhydron	234
Ano Armakitha Bay	268
Antakiyeh	580
Antaradus	584
Anti Dragonera	74
—— Lebanon Range	597
Antikaros	228
Antikithera Channel	78
—— Island	75
Anti Mila	196
Antimilos Island	197
Antiparos	222
—— Island	219
—— Point	223
—— Strait	223
Anti Psara	306
—— Pyrgos	481
Antioch	580
—— Bay	579
Antiochia	547
Antonio monastery	590
Anti Tilo	259
Anvil Rock	375
Apano Islet	288
—— Kupho Islet	228
Aphandos Bay	245
Aphendi Vuno	429
Aplotheka, Port	263, 525
Apokrusis	202
Apolakia, Bay of	247
Apolitares, Cape	76
Apostoli, Cape	264, 265
—— Rocks	405
Apostolos Bay	129
Apothero Bay	358
Appolonia, town of	200
Araba Islet	526
Arab-guelli	488
Arabi Point	110
Arab's Gulf	486, 488
—— Gureina	476
—— tower	488
Aranka, Point	209
Arap Adasi	526
Arapi Point	156, 165
Arapos Mermedia Bay	400
Arasma, Port of	65
Arazo Road	153, 156
Arcadia Mountain	58
Archangelo, Cape	245
Aren Kioi Bay	396
—— —— village	393
Arganoa Bay	288

Digitized by Google

	Page
Argennum Promontory	313, 335
Argentiera Island	198
Argiros Nisi	148
Argolikos, Gulf of	80
Argos, plains of	80
——, town of	81
Athenous Bay	235
Arin Dagh	267
Arineh Bay	266
Arineh, town	266
Arineth Bay	265
Arish el	609
Arkakion Island	163
Arkasa Bay	251
Arkhangelo	65
Arkhangelo Bay	65
Arkhangelos Island	291
Arkialla Point	284
Arki Island	294
Arkondo Islet	317
Armathia Bank	252
Armenisti, Cape	217
Armyro	249
—— Bay	419, 420
—— Port	143
—— Potamo, port of	129
—— River	419
—— Rivulet	422
—— ruin fort	419
Arnauti, Cape	555, 567
Arsenal basin	514
Arsida Island	116
Arsinol, town	565
Arsus	578
—— village	578
Arsuf	605, 607
Artemision, Cape	151
Artez Point	320
Asarjik, ruins	527
Asclepios	98
Ashdir Ras	447
Ashilada	540
Askania Islet	239
Askelon	608
Askino Nisi	259
Aslam Burnu	319, 324
Aslan Burnu	342
Asmeni Ridge	149
Asomato, Port	59
Aspat Rock	284
Aspra Isles, North	293
—— ——, South	293
Aspro, Cape	320, 556, 557
—— Islet	205, 236, 307
Aspros Kavo	341, 351
Aspro-mitas	526
Aspro, Mount of	67
—— nisi	299
—— Point	168, 169, 229, 364
—— Rock	226
Assar Bay	539
Assos, ruins	370
Astale of the Stadiasmus	421
Astios, Cape of	81
Astratigos, Mount	66
Astros, village of	80
Astypalœa	253
Ata Islet	269
Atalanti Bay	143
—— Island	143
—— town	144
Atalanta Islet	108
Athena	100
Athens, harbor of	110
Atherida Point	174, 176
Athlit ruin, tower	604
—— village	604
Athos, Mount	181, 184, 185, 371
Atimo Islet	230
Atmak Point	273
Atsaki Islet	285
Attalia Harbor	545
Attayaro	248
—— Mount	241
Aulaki Bay	119
—— Islet	264
Avelos Rock	234
Avgo Islet	126
—— nisi	253
Avalaka Point	398
Avlabo Point	127
Avona, Cape	543
Avthoki Island	533
Axia Bay	369
Axini Islets, North and South	70, 71
Axius River	580
Ayano, I	488
Ayas Bay	571, 572, 573
Ayas Fort	572
Ayash	550
Ayasmata, Bay of	364
Ayas town	574
Ayia Irmi village	569
Ayios Yoannis Point	566
Azizieh, plain of	417
—— village	418
Athens, Gulf of	94

Digitized by Google

B.

Page.

Baba, Cape.... 370
—— Island.... 269
Bacchus, Islet of.... 225
Badalena Bay.... 264
Bagasse.... 549
Baidia, Port.... 482
Bailey Shoal.... 375
Baitani Point.... 227
Bakir Chai.... 353
Baklar Burnu.... 400
Baklar, Port.... 401
Bakshuba, Jezirat.... 485
—— Mainsa.... 485
—— Ras.... 485
Balanea.... 584
Balanti, Mount.... 145
Balisu, Cape.... 274
Bali Bay.... 421
Balounopetra Point.... 567
Balu Point.... 277
Balustra, Cape.... 193, 406
Banias.... 584
Baraka Xera.... 256, 257
Barba Nikola.... 269
Barbarusa Islet.... 205
Barbia Islet.... 358
Bardiki Bay.... 148
Bargassa.... 278
Bargylia Creek.... 298
Barometer.... 37, 41
Barrier of the sea.... 394
Basake Spits.... 328
Bashika.... 191
—— Bay.... 386, 387, 394
—— Point.... 387
Bashik Tepe.... 387
Basilicus Bay.... 300
Bath, the.... 195
Batraki Rocks.... 534
Batrun.... 589
Bayas.... 574, 575
Bayit, Rosel.... 579
Bayuk Mendere, caution.... 303
Bazit Bay.... 581
—— Rasel.... 581
Beacon Hill.... 349
—— Peak.... 316
—— Point.... 482
—— Rock.... 131, 132
Beard catcher.... 575
Beehive Rock.... 355
Beheira, Lake.... 512
Beheira. *See* proper name.
Behram.... 370
Beirut, Port.... 591–593
—— Ras.... 591
—— town.... 593, 594
Beit Meri, village.... 591
Bekchi Islet.... 277
Bektasat Sakan.... 352
Bellane Islet.... 587
Belat Jebel Range.... 599
Belbina Island.... 94
Beldi el Melek, Ras.... 584
Belo Pulo.... 80
Bengasi.... 469
Bengahua Jebel.... 463
—— Ras.... 463
Benghazi.... 469
Beni el Adid Jebel.... 461
Beni Jidem Range.... 475
Benmur Sidi.... 454
Berdugi Islets.... 128
Berek, Ras el.... 463
Berenice.... 473
Berss.... 474
Beyrout, Port.... 591
Bhamdun.... 595
Bhurda, Jezirat el.... 480
—— Reefs.... 480
Bianco, Cape.... 312, 313, 335
Biennus, Port.... 445
Binboa Dagh.... 572
Bird Islet.... 341
—— Rocks.... 466
Birsis.... 474
Biteh Bay.... 283
—— Point.... 283
Bittern Point.... 573
Bisti, Cape of.... 89
Blabi Rocks.... 213
Black Islet.... 431
—— Rock.... 139, 307, 318, 373, 529
—— —— Islet.... 227
Blal Sidi.... 449
Blaro Islet.... 291
Blitra, town of.... 65
Bluff Point.... 486
Boabet el Taht.... 596
Baalbek.... 597
Boasa, Ras.... 478
Bogaz.... 566
Bogaz el Grand.... 470
Bogaz el Juliana.... 470
Bogazeu Xera.... 256
Boghaz, beacons.... 493
Boghaz, regulations.... 493
Boghazi, Port.... 317

Digitized by Google

	Page.
Bokcha Adasi	383
Bolemo Islet	339
Bombah, Gulf of	480
Bombarda Point	196
Bordj el Agres	448
Borgo di Mirabella	429
Bori, Lake	403
Botos Bay	193
Botris	589
Bou Kemesh Bay	447, 448
—— —— fort	448
Bourg	489
—— Fort	507
Bournabat, village of	332
Boz Dagh	318
Brasides, Cape	188, 190
Brega Marsa	465
Brisa, Cape	359
Bristonis, Lake	406
Bromboli	87
Brooker Bank	370
Brown Rock	307
Brullos, Cape	509
Brulos, Cape	509
Brumana, village	591
Budrum Bay	282
—— Harbor	282
Buda Point	373
Budaria Islet	224
Bueb Bay	467
Buey Rock	229
Buffavento, Mount	570
Bugali, Cape	339
Bujal, village of	332
Buka, plains of	597
Bulbulithera Hills	158
Bullmore Patch	191
Bunes Islet	154
Buoyage system	45
Buoys and beacons	47
Buoys	13
—— bell	13
—— gas	13
—— whistle	13
Bureiga	465
Burbara, Ras	590
Burgi, fort of	82
—— islet of	82, 95
Burj al Maisa	595
—— Enfeh	588
—— channel	130
—— —— directions	131
—— Point	130
—— Spit	130
Burnt Island	199
Burughiul, Lake	406
Burunli	578
Busa, Cape	409, 411
Bushaiba, Ras	469
Bustan Burnu	401
Buves, the	224
Buyuk Mendere	302
—— Sahib Islet	319

C.

	Page.
Cœle Syria, valley of	580
Caledonia Shoal	366
Colonna, Port	117
Camarella Creek	76
Cambrian Rock	169
Cameron Shoal	375
Cana promontory	354
Candia, town	422
—— island of	407
Canea	413
Cane Island	363
Cape Puda Shoal	165
Cape. *See* proper name.	
Capuchin Convent	562
Cara Krakari	111
Carmel, Mount	603
Carmel Reefs	603
Carpatho Rock	251, 252
Caruba Bay	433
Casius Mons	522
Castabolum	574
Castela, port of	114
Castello Bay	251
—— Point	250, 251
Castle Island	276
Castroulli Point	566
Cavaliani Island	128, 129
Cavaliere, Cape	548
—— Island	534
—— Port	548
Cavamith	192
Cave Point	118
Caxo Island	249, 252
Caystius	340
Cedars of Lebanon, The	589
Celenderis, Port	548
Cerigo Channel	77
Cerigotto Channel	78
—— Island	75
Cerigo, town of	69, 72
Cervi Channel	77
—— Island	66
Chakalaria, village of	417

Digitized by Google

	Page.
Chakali, Mount of	83
Chanak Liman	275
Chana Ovasi, brook	399
Chandarli, Gulf of	351
Chapman Rock	226
Chatal Burnu	529
Chatalia Bay	268
Char A Zhizi, village	187
Chardagh	175
Charts	9
—— accuracy	11
—— distortion	12
—— fathom curves	12
—— large scale	12
—— small scale	12
—— pilot	11
—— planes of reference	15
—— mercator	13
—— note	13
Chaua Jebel	466
Chebek, Port	461
Chega Wad	463
Chelik Point	338
Chelindreh, Port	548
Chemali, Cape	351
Chenesar Islet	85
Cherif Basin	514
Chesil Liman	297
Chesme Bay	312, 313
—— town	314
Chiflik Island	526
Chifut Kalessi	284
Chigri Mountain	382
Chinarli Burnu	354
Chionia, Mount	560
Chiralu Bay	543
Chiro Nisi	299
Choralolimani Bay	305
Chuka Channel	285
—— Islet	284, 285
Chulukioi Cove	298
Chustan Island	320
—— —— passage west	321
—— Point	321
Cilicia Plain	571
Claro Islet	302
Clazomensæ Islet	322
Cliff Point	425
Climate	36
Cnidus	270
Coal	33
Colias, Cape of	115
Colonna, Cape	94, 116, 117, 344
—— Rock	242
Commercial	514
Communications, railroads	31
—— steamers	32
Copias, Lake	143
Cordaleo	327
—— village of	333
Coral Bank	428
Coja Chemen Dogh	397
Corinth Canal	104–106
—— Isthmus of	103
Corvette Pass	495
Crag	573
Cragus	547
Cranæ Islet	62, 63
Crete, Island of	407
—— South Coast	434
Cristiani Islets	239
Culloden Shoal	507
Currents	42, 44
—— coasts of Libia and Egypt	44
—— Syria and Kalamania	44
—— Cyprus	44
Current arrows	17
Currency, Greek	30
—— Turkey	31
Cyclades	195, 249
Cygnet Rock	183
Cyme, ruins	35
Cynossema, Promontory	52
Cynthus, Mount	215
Cyprus, communication, Government, harbors, products, etc	53, 54
Cyrene, city of	476

D.

	Page.
Daas-mia	457
Dabagha tannery	596
Dactylo Point	534
Dades Point	560
Dædola, ancient city	532
Dahar el Salah	607
Dahling Point	368
Dairi Islets	275
Dakalla, marsa	486
Dalamon Bay	531
—— River	531
Damietta Banks	510
—— mouths	510
—— to Port Said	512
—— town of	511
Damur, Ras	594
Dana Point	96
Daphni, quarantine station	185
Daragaz Point	329

Digitized by Google

	Page.
Daragaz Point Pier	331
Dardanelles, directions for sailing vessels	396
—— regulations for navigation	393
Dardania Island	398
Dar Natur	587
Dasa Islet	167
Dascalio Point	346
Daskalio Islet	79
Datcha Bay	267, 268
—— town of	268
Dava Burnu	326
Dawkins Hill	372
Debeh, bight of	512
Dedeagh, town of	403
Dedeagatch, town of	403
Dedeh Dagh	573
Deguir Point	282
Deirmen Burnu	325
Deirmi, Mount	352
Deli chai	575
Deliktash, village	543
Delo Rocks	227
Delos	195, 215, 216
Delphi, Mount	124, 150, 166
Delphini Rock	204
Delphinon	483
Delsi Sidi	454
Demaristika, Point	61
Demetrios Point	387, 391, 392
Demseid, wad al	454
Denir Liman	297
Denusa Island	229
Denzuaga Ras	461
Deremen Buki	274
—— Port	274
Despotiko Island	223
—— Port	222
De Totts Battery	395
Devils Harbor	347
Devthero Cove	188
Devtheropolis	188
Devtheros, Cape	187
Dhabba, Ras et	486
Dhascalia	83
—— Islet	83
Dhaskalia Island	432
Dhia, Cape	421
Dhikora, Pass of	61
Dhoko Island	90, 92
—— Strait	90
Dhor el Khodib	589
Dice Island	424
Diapori Island	304
Diaporii Islets	103
Diamond Rocks	506
Diamanta Petro	470
Diavati Islets	153, 154
Dibar Ban	269
Dibaki Bay	438
—— village	438
Dictamnum, town of	412
Didyma, Mount	92
Didymi	302
Dikili, village	364
Dili Strait	216
Dimitri Island	182
—— port of	182
Dimitrius Rock	155
Dionysiades Insulæ	430
Dihlo Islet	224
Dipsa Rock	127
Direk Ondessi River	547
Dirphi, Mount	124
Dirsek Point	320
Disaki Islet	89
Docks	33
—— patent slip, etc	611
Dohan Aslan, Mount	401
Dokos Island	90
—— Strait	90
Dolos, Cape	558, 559
Dominiko, Cape	348
Dorian Creek	273
—— Isthmus	267
—— Promontory	267, 269
Doris, Gulf of	265
Doro, Cape	137
—— Channel	136
Dragonara, Islet	430
Dragonera Islets	74
Dragonisos Islet	219
Drako, port of	110
Drapi Island	86
—— Islet	89
Drepano	390
—— Cape	148, 180, 416
—— Hook of	325
—— Island	325
—— Islet	383
Drepanaki Point	534
Drepanum, Cape	555
Drima Islet	228
Dryopis, village of	202
Duck Rock	276
Durvanda Bay	297

Digitized by Google

Page.
Dumuz Burnu..... 346
Dysvaton Islet..... 210
Dzeira, Port..... 458

E.

East Bay..... 424
—— Cape..... 400
—— Islet..... 529
—— Pass..... 373, 527
—— —— directions..... 377
Ebal, Mount..... 607
Echinosa Islet..... 228
Edku, Lake..... 508
Edmonds Rock..... 529
Egrilar, Port..... 336
Egri-liman Channel..... 317
—— Port..... 317
Egypt..... 51
—— climate..... 52
—— Government..... 51
—— harbors..... 51
—— products..... 51
—— trade, etc..... 51
—— coast of..... 482
Ehduz Bay..... 448
Ehnii, Jezirat..... 479
Eiraka, Port..... 168
Ejelmar Bay..... 400
Ekato Kephales, Port..... 381
Eki Kardarslar..... 354
Ekinos, Cape..... 146
Ekklino Point..... 121
El Abas..... 585
—— Islet..... 586
Elæa, Cape..... 563, 566
—— port of..... 353
Elapha Islet..... 127
Elaphonisi..... 445
Elaphonisos Channel..... 63, 77
—— Island..... 58, 66, 67
El Arish..... 522
Elasa Island..... 253, 432
El Bostan..... 572
El Burj Islet..... 583
Elea, port of..... 64, 65
El Egaitee..... 486
Eleos Island..... 365
—— Pulo..... 363
—— Rock..... 363, 365
Elesa Island..... 526
Eleusa Island..... 116
Eleusa Islet..... 102
Eleusis, Bay of..... 108

Page.
Eleuthera, Cape..... 186
—— Island..... 186
El Fana Islet..... 585
El Fara..... 490
El Ganem..... 506
El Ghuzir, monastery..... 590
El Hassan..... 506
—— Ras..... 584
El Hut Rocks..... 495
Elias, Mount... 87, 147, 195, 229, 230, 235, 282, 305, 306, 308, 383, 393
El Kulat..... 584, 586
Ellada River..... 146
El Lados, Ras..... 586
Elfie Rock..... 467
Elmsel, Ras..... 455
El mina..... 584, 586
Elmino Point..... 290
El Mohraka..... 603
Elos Peninsula..... 58, 65
Emeji, Cape..... 273
—— Mount..... 268, 273
Emporio..... 289
—— Bay..... 248
Emmachae Island..... 480
Enfeh, village..... 588
English Harbor..... 321
Enharit Khurzita, Marsa..... 480
En Nesleh..... 608
Enos, town of..... 403
Entrance House..... 356
—— Point..... 60
Epano Georgios..... 269
Epanomeria..... 235
—— town of..... 235
Eparchia of Sitia..... 429
Ephesus, ruins of..... 340
Ephtanah Rocks..... 240
Episkopi..... 222
—— Bay..... 557
—— village..... 557
Equidaurus Peninsula..... 99
Eqidavro, port of..... 98
Erba Aksur..... 479
Erchuse Chai..... 266
Erekevi, Port..... 337
Eremopoli Bay..... 433
Ereno Point..... 284
Eretria, Port..... 129
Eretri, village..... 129–130
Ergastena Bay..... 118
Erimo Nisi..... 358
—— —— Islet..... 91

Digitized by Google

Page.

Erinia Islet 154
—— Rocks..... 154
Erissos..... 186
—— Bay..... 185
Eritra..... 312
—— Bay..... 314, 315, 318
—— town of..... 315
Eros, Mount..... 86, 90
Erythræ..... 315
Erythræum promontory..... 435
Escombe Point..... 190
Esdraelon plain..... 601
Eskhati Rock..... 239
Eski Adalia..... 545
—— Adasi..... 353
—— Hisarlik..... 395
—— Stambul, Cape..... 382
Esparto Jetty..... 453
Etchen Chai..... 536
Eubœa, current..... 152
—— island of..... 124
—— northeast coast..... 149
Eunostos Point..... 488
Euripo (Khalkis)..... 133
—— Channel..... 129
—— north roadstead..... 136, 141
—— outer port..... 131
—— Point..... 124
—— Strait..... 134
—— —— directions..... 135
—— —— northward of the bridge. 135, 141
Euripus Strait..... 124
European Castle..... 387
Euro Point..... 217, 218
Eurotas River..... 58, 64
Euryalus Rock..... 165
Eurymedon River..... 545
Evdhimous Bay..... 557
Evoikos..... 142
Evripos Channel..... 129
Exeris, Cape..... 234
Exo Diavati..... 153
Exomiti, Cape..... 238
Exports..... 30
Ezliten, village..... 457

F.

Falcon, the..... 358
False Bay..... 528
Fahm, Um el..... 607
Famagusta Harbor..... 563–566
—— town..... 565
Fanar Burnu..... 319

Page.

Fanari Point..... 160
Fasori, Ras el..... 581, 582
Fearless Point..... 183
Felibejik, hamlet..... 189
Fengari, Mount..... 398
Fenor Point..... 406
Fig tree..... 337
Fikas Point..... 220
Firefly Rock..... 595
Fishery Point..... 250
—— Spit..... 327
Fishing vessels, lights..... 49
Fixing position..... 17–23
Flat Hill..... 533
Fog..... 41
Foggia Nova..... 351
Fog signals..... 14
Foujes Harbors..... 324
—— town..... 324
Fountain Head..... 599
Foul Point..... 356
Fourteen-foot Pass..... 224
Fragrant Isle..... 366
Franco, Port..... 99
Frank Castelli..... 441
Fuller Cove..... 372
Furni Boghaz..... 296, 304
—— Islands..... 303
—— Pass..... 304
—— Rock..... 296, 304
Frying Pan..... 410

G.

Gabala..... 583
Gabari, coal mole..... 490
—— Mosque, sidi..... 496
Gabisa, Ral el..... 486, 487
Gadaro..... 383
——Islet..... 384, 386
—— —— or rock..... 170
—— Little..... 384
Gahbess Reef..... 487
Gaidaro..... 302
—— Cape..... 136
—— Island..... 117, 143, 213
—— Islet..... 139, 288
—— Nisi..... 259, 436
Gales..... 39
Galley Point..... 383
Gallipoli, Port..... 277
Galounia..... 570
Galounopetra Point..... 567
Gamma, Ras bel..... 480

Digitized by Google

Page.

Gardaro, Cape..... 142
—— Island..... 205
—— Islet..... 142
Garden Bay..... 93
Gardiki Bay..... 148
Gargari Islet..... 287
Garen Cove..... 318
—— Rocks..... 318
Gastria Bay..... 566
Gata, Cape..... 558
Gatza, Cape..... 142
—— Islet..... 142
Gavathi Islet..... 317
Gavatha Rock..... 361
Gavdo Pulo..... 443
Gavrion Bay..... 138
—— Islets..... 139
—— Port..... 139
—— —— communication..... 140
General plan..... 29
—— remarks..... 29–71
Genovese, Port..... 542
Georgia Channel..... 109
—— Islet..... 294
—— Nisi..... 110
Geraneia, Mount..... 101, 107
Gerias, Cape..... 210
Gerizing, Mount..... 607
Ghara Jezirat..... 466
—— Ra sel..... 593
Gharami Umm al..... 479
Gharb, Port..... 274
Gharib, tabiet el..... 510
Ghemil, Port..... 512
Ghemines Hill..... 468
Ghelmez..... 393
Ghertis..... 308
Ghiawur..... 571
—— Dagh..... 572
Ghiovr Kioi Bay..... 339
Ghiuk Suyu..... 549, 550
Ghiul Bay..... 297
Ghuzzeh..... 607
—— town..... 608
Gialtra Bay..... 145
Gilboa, Mount..... 601
Giova Bay..... 272, 278
—— Port..... 278
—— River..... 278
Githion..... 62
—— Port..... 58
Glaro..... 291
—— Islet..... 151, 209
—— Nisi..... 291, 425

Page.

Glino Nisi..... 256, 257
Glipho Point..... 223
Glossa..... 166
Glossaries..... 7, 8
Glykora Point..... 345
Glykyotissa Islet..... 569
Glymi, Port..... 352
Glypha Bay..... 148
Goat Island..... 257
Gœsus..... 303
Goni Island..... 312, 315
Goremi Point..... 137
Goritza Hill..... 160
—— Point..... 160
Gortyna, port of..... 439
Grabusa Harbor..... 410
—— Islet..... 410
Græpodi River..... 345
Grammata Head..... 204
Grammatice..... 129
Grambusa Island..... 542
Grandes Bay..... 433, 434
—— Islands..... 433
—— Reef..... 433
Granite Point..... 215
Gravusa Islet..... 229, 231
Greater Delos..... 213
Great Pass..... 489, 491
Grecian mining industries..... 30
Gredia, Cape..... 311
Gregali Point..... 169
Gregrien Reef..... 486
Greco, Cape..... 394, 395, 563
Gremea, Cape..... 399, 402
Griko, Port..... 295
Grilussa Island..... 293
Grius, Mount..... 299
Griva, Cape of, Trikiri Peninsula... 165
Grosso, Cape..... 57, 72
Grovanni di Patino..... 294
Grunia Rocks..... 71
Guardian Rock..... 225
Guderu, Cape..... 435
Guirejik Island..... 282, 283
Gul-baghche, Gulf of..... 318, 320
Gulf. *See* proper name.
Gull Islet..... 425
—— Rock..... 268
Gumbet Bay..... 283
Gumishlu, Port..... 286
Gurnia..... 429
Gurnais, Cape..... 165
—— Shoal..... 165
Gurto Point..... 167

Digitized by Google

Page.

Guruni Head, light 167
Guvergenik Bay 296, 298
Guzel Assar Chai 352
Gyaros Island 209
Gymno Island 365
Gythium 62

H.

Habeish 599
Hagia marina, Cape 128, 129
Hagios Kosmas, Cape 209
Haifa 602
—— town 602
Haji Liman 326
Haleb, town 576
Haleima, Ras 482
Halonisas Channel 167
—— Island 168
Haman, village 586
Hamaxia 547
Hamet Kas 458
Hamidieh Harbor 190
—— village 192
Hamidie Fort, light 450
Hammam Islet 604
—— Rock 476
Hamra, Ras al 455
—— Rocks, Ras al 455
Hamud Rocks 466
Haram, umm 560
Harbor Bank 490, 497
—— Shoal 60
Hassan, Plains of 454
Hebræo Kastro 202
Hebreo Island 221
Hebrus River 403
Hecate Island 216
Helena, Point 66
Helene Island 120
Helles, Cape 394
Helos Plain 58
Heraklea 422
Heraklia 234
—— group 229
—— Islet 228
Hericha Rocks 466
Hermo Islet 281, 320
Hermon, Mount 597, 604
Hermopolis, town 204, 206
Hevræo 99
Hieraphytna, city of 435
Hierapetro 435
—— Isthmus of 426

Page.

Hissa Bank 460
—— village 460
Hole in the Wall 496
Holy Mountain 184
Homfis, el 486
Homs, village 456
Hussein Jebel 467
—— Point 284
Hydra Bay 92
—— Cape 319, 324
—— Island 90, 92
—— town of 91
Hydrea Island 90
Hydriotes 90
Hydrographic Bulletins 11
Hydrographer Shoal 492
Hyetussa 302
Hymettus 112
—— Mount 116
Hypsili Island 84, 538
—— Islet 101, 102, 339

I.

Ialos 260
Iassus 299
—— Bay 298, 299
Iberon Bay 185
Ibriji, Cape 402
Ibu Hani, Ras 582
—— Ras, Peninsula 582
Icheifa, Jezirat 465
Ida, Mount 368, 420
Idmid 599
Ieraka, Cape of 79
—— port of 79
Ieri, Cape of 84
Iero Adasi 532
—— Port 328, 354, 355
Ieronda 302
Iersis Islet 324
Ikaria 348
Ikikat Rocks 300
Ikinji Islet 265
Ikvan Rock 495
Il Hereh Bay 588
Ilija Bay 369
Imbori, village 260
Imbrasus 344
Imbros Island 392, 396
—— —— North Coast 398
Imports 30
Inek Burnu 529
Iniji River 532

Digitized by Google

	Page.
Injah Point	269
Injerli Islet	324
Ioannis, Port	432
Ios Island	233
—— port of	233
Ipsario, Mount	190
Ipsera Island	263, 525
Ipsiri Islet	584
Ipsi Wad	455
Irene, Cape	371, 382
—— Port	202, 203
Iris River	58, 64
Isabel Rock	300, 533
Isboras	186
Isene, port of	299
Ishaila, Jezirat	483
Ishaila Rocks	483
Iskanderun Bay	575, 576
—— Gulf of	571
Island Reef	337
Island. *See* proper name.	
Ismail Basin	514
Isola Brusiata	199
Ispatho Island	376
Issus, Plain of	571, 575
Isthmia	103
Isthmus of Kombi	375
Iura Island	162, 171

J.

Jackal Point	329
Jaffa	605
Jaihun Chai	571, 572
—— Spit	572
Jawur Dagh	571
Jeba Jebel	460
Jebeil, village	589
Jebel. *See* proper name.	
Jebelli	583
Jedra, Ras	595
Jerid Rocks	46
Jeriza Jebel	464
Jezirat. *See* proper name.	
Jezireh	595
Jew's Castle	202
Joannis, Cape	213
—— Islet	88
Johnston Bank	370
Judea Mountains	607
Juliana, Marsa	469
Juliano Peninsula	470
Juma, Plains of	454
Jun (*see also* proper name)	459
Jun al Khudr	591
Jun al (*see also* proper name)	459
Juneh Bay	590
—— village	590
Junil Meleha	487
Juno, temple	303
Jupiter Panhellenius	100
Jura Island	139, 209
—— Shoal	536

K.

Kabakum Bay	355, 364
Kabanos, Cape	137, 211
Kaboura Island	220
Kabrit, al	464
—— Jun al	459
Kabura Islet	224
Kachuni Point	346
Kadi, Wadi el	595
—— Kioi, village	402
Kadin River	278
Kadisha River	586
Kaia Rock	527
Kaid Bai, fort	489
Kaikas	353
Kaimeni Creek	235
—— Islets	238
Kaio, Port	57, 59, 60
Kaisariyeh	604, 605
Kakava Island	539
—— Road	539
Kaki Kephali Point	136, 141
—— Skala, castle	63, 64
Kako Point	215
Ka Kora Bay	468
—— —— Ras	468
Kakoskaliov Islet	568
Kakovuni, Mount	57, 61
Kalabak Point	320
Kalamaki Bay	99, 103, 311, 536
—— Cape	371
—— Point	98, 535
—— village	103
Kalamata Gulf	58, 62
Kalamitza Bay	153
Kalamo Islet	366
—— Pulo	366
Kalamuti	190
—— Bay	312
—— Harbor	192
Kalando Bay	227
Kalapodi, the	293
Kalat. *See* proper name.	

Digitized by Google

	Page.
Kalat al Bahr	595, 596
—— Hakmone	586
Kalatissia, fortress	575
Kalauri, Cape	96
Kalauria Island	94
Kalavarda, village of	241
Kalavros Islet	289
Kalessi Point	282
Kalifatia	329, 332
Kalika Point	223
—— Rocks	223
Kalitheas Bay	245
Kalivia, village of	418
Kalizusha Reef	450
Kalloni, Port	354, 358
Kalo Limniones	439
Kalimno Channel	290
—— Island	287
—— Port	288
Kalolimni, Mount	249
Kalo Limniones	437
Kalolimno Island	287
Kalomeri Point	311
Kalonero Bay	435
Kalosuru, Cape	269
Kalota, Cape	229
Kalotari, Cape	231
Kaloterion Bay	229, 230
Kaluiri Rock	85
Kaloyeraki Point	374
Kaloyeri Island	265
—— Point	380
—— Reef	313, 436
—— Rocks	138, 305
Kaloyero Point	215
Kaloyeros	232
Kaloyeros, Great	138
—— Little	138
Kamares Bay	200
Kamari Point	238, 498
Kamenaki Breakwater	218
—— town of	217
Kaminaki, Cape	309
—— of Khios, Cape	316
Kamila Nisi	253
Kamili, Cape of	78
Kamina Point	221
Kamini Islet	91
Kanais, Gulf of	486
—— Ras el	486
Kanapitza, Cape	303, 342
Kanat, marsa el	491
Kandeliusa Island	258

	Page.
Kandili, Mount	124
—— Mountains	142
Kantzilieres	412
Kapela, Cape of	73
Kaphkana Islet	187
Kaplan Point	282
Kaphireus	136
Kapnia Burnu	53
Kapi Cove	531
Kapota Islet	300
—— Shoal	300
Kappari	285
—— Channel	271, 286
—— Island	271, 285
—— Islet	91, 92
—— Port	92
—— Shoals	91
Kapri Point	159, 160
Kapsali Bay	69, 71, 73
—— village of	73
Kara Ada	281, 282, 284
—— Agatch Bay	406
—— Baba, fort	131
—— Burnu	546
—— —— Peninsula of	318
—— —— —— coast of	320
—— Cape	176
—— Esek Mount	264
—— Point	268, 369
—— Su	187
—— —— Cape	193
—— —— River	406
Kara-tepeh, Cape	368
Karabaghla Channel	285
—— Islands	284
—— Point	284, 285
Karada	281
Karadagh, Mount	351, 354
Kara Dagh Point	314
Karadash Burnu	554
Karadash Khan	571
Karadavar, village	553
Karaghatch Harbor	529
Karahdereh	298
Karako Point	301
Karamaki	264
Karamania	52
—— Communications	83
—— Harbors	52
—— Supplies, etc	52
Karamea Islet	265
Karamuk Rocks	274
Karaool Islands	539

Digitized by Google

Page.

Karathona Bay..... 83
—— Island..... 83
Karavi Islet..... 80
Karavolos, Cape..... 247
Karavopetia Islet..... 570
Karavos..... 232, 233
Karavostasi, port of..... 232
—— village..... 568
Karavotra Islet..... 344
Karavugia, Cape of..... 70
Karazora Island..... 535
Karrachin Bay..... 109
Kar Boghaz..... 539
Kardiotissa..... 233
—— Islet..... 232
Kardak Rocks..... 285, 287
Kargan Adasi Islet..... 341
Karghi Adasi Islet..... 527
Kargo Nisi..... 298
Kari, Cape of..... 79
Karies..... 185
—— town of..... 183
Karitza, village..... 173
Karjah Islet..... 275
Karlovassi..... 347
Karmari Island..... 264
Karos Islet..... 228
Karsarek Jebel..... 571
Kartera..... 324
Kartsimon Point..... 155
Kartaro River..... 425
Karteli Islet..... 89
Karyanda..... 297
Karajanda, port..... 298
Karystos Bay..... 124, 138
—— town of..... 125
Kasalkioi..... 299
Kas Burun..... 522
Kasikli Bay..... 299, 300
Kasida Islet..... 167
Kas Mountain..... 382
Kaso Island..... 249, 251, 252
—— Islets of..... 252
—— Rock..... 252
—— Strait..... 253
Kassandra, Gulf of..... 175, 180
—— Peninsula..... 180
—— Point..... 175
Kassos Island..... 252
Kastana Point..... 185
Kastelli Melapotamo..... 421
—— Selino..... 445
Kastelorizo, Gulf of..... 537
—— Island..... 536, 537

Page.

Kastri, Cape..... 92
—— Head..... 137, 139
—— Point..... 230
—— town of..... 92
Kastro..... 379
—— Cape of..... 77, 181
—— Harbor..... 192
—— Island..... 372
—— Ledge..... 380
—— Nisia..... 165
—— Port..... 210, 310
—— town of..... 197, 210
Kastron, village..... 230, 231
Katabasis, Cape..... 347
Katabia, Cape..... 247
Katagar Point..... 369
Katapola, village of..... 230
Katarina, skala of..... 174
—— town..... 174
Katergaki Rock..... 58
Katergari Islet..... 254
Kathura Spit..... 329, 332
Kato Armakitha..... 268
—— Islet..... 285
—— Kupho Islet..... 228
Katomeri, Cape..... 227
Kavach River..... 401
—— village..... 401
Kavaki Bay..... 337
Kavala..... 190
—— Bay..... 188
—— town..... 189
Kavallos Bay..... 434
—— Islets..... 434
—— the..... 434
Kavia, Port..... 121
Kavo Agio Phokas..... 349
—— Aktis..... 252
—— Armenoi..... 254
—— Asar..... 298
—— Flomi..... 444
—— Grœas..... 300
—— Kalamaki..... 164, 240
—— Khilus..... 254
—— Maru..... 259
—— Melissa..... 438
—— Mikron Taliane..... 340
—— Nisi..... 411
—— Noria, Cape..... 263
—— Pelagusa..... 259
Kavulia, Cape, Light..... 156
Kavura, Cape..... 116
Kavyas, port of..... 121
Kawa Burun..... 510

Digitized by Google

	Page.
Kazalu	553
Kazil Islands	533
Kefr Lam, village	604
Kekhries Bay	99
—— Beach	99
Kelevini Island	93, 94
—— Pass	93
Kelb, Ras el	590
Kelpho Islet	180, 181
Kemer Bay	368
Keminakia	570
Keneiseh, Jebel	589
Kento Point	171
Kephali, Cape of	75, 76
Keos Island	121
—— Tepeh Bay	329
—— ——, village of	333
Kephala Bay	289
—— Cape	149, 152, 396, 437
Kephalo, Cape	191
Kephalos, Cape	203
Keram Dagh	279
Kerame Bay	349
Keramidi Islets	286
Keramos Bay	279
—— city of	280
—— Point	280
Keranda, Mount	279
Keras Point	315
Kerata, Cape	143
Keraton Bay	436
Kereamathi, Port	431
Keremidli Harbor	193
Ker Kareh	449
—— —— Marabut	452
Kerki, Mount	342
Keshan	402
Kesr Cove	275
Kessab Bay	581
Keugezi Bay	530
—— Lake	530
Kezil Burnu	530
—— Point	313
Khahan Wad	457
Khaifa	602
Khalavra Isles	292, 293
Khalkia	259
—— Island	247, 248
Khalkyas	251
Khaidari, port of	84
Khalkis, town of	131, 133
Khania Bay	412
——, capital of Crete	413
Khania Harbor	414
—— Plain	412
—— town	412
Khan Yunas	609
Khanzir, Ras el	571, 579
Khara, Ras	460
Kharos Bank	382
—— Point	382
—— Reef	382
Khaskos Islet	265
Khatar Point	282
—— Rocks	244
Khediz River	327
Khelia Islet	295
—— Rock	295
Kheliatho Islet	151
Khelidromi Channel	167, 168
—— Island	162, 168, 169
Khelonæs Anchorage	567
Khelidonia, Cape	541
—— Islet	541
Kheli, port of	85
Khelona, Mount	97, 112
Kheraki, North Coast	384
Khereia Islet	288
Khersonisos	199
—— Bay	426
——Cape	425
Khilia, Mount	168
Khina Rocks	247
Khios, East Coast	309
—— Island	306
—— Strait	312
Khiuni, Capes	221
Khlomo, Mount	143
Khoklakari Bay	358
Kholofonos	252
Khoma, fishery	174
Khoms Bay	456
—— village	456
Khondro, Cape	420
—— Kavo	421
Khora	344
—— village of	230
Khorephto, village	172
Khoti Islet	570
Khrysokhou Bay	567
Khudr	580
Khurman Su	572
Khushmid Maher	604, 607
Kidonia Islet	363
Kid Rock	257
Kiervasili, port of	266, 267

Digitized by Google

	Page.
Kiervasili, village	267
Kinossima Promontory	263
Kiladia, port of	84
Kili Islet	151
Kiliomeli, Cape	146
—— Light	147
Kilcarda Burnu	546
Kilsali Island	321
Kimasi, Port	151
Kimatisa, Mount	65
Kimina Islet	236
Kimolas Island	198
—— village	198
Kinaros Island	290
Kinduna Patch	382
Kinduno Point	259
King George I Breakwaters	111
Kinlu Point	318, 319
Kio Islands	316
Kisamo Bay	411
—— town of	411
Kishlar Rocks	400
Kishle Buku	281
Kisilad Islet	188
Kishon River	601
Kislar Dagh	399
Kissobo, Cape	173
Kisternes Hill	57, 59
—— Point	58, 59
Kithera Channel	77
—— Island	69, 72
—— Mount of	69, 71
—— town of	69, 72
Kitheria, West Coast	70
Kiti, Cape	560, 561
Kitriani Islet	200
Kiulukioi Cove	298
Kiuvergini	298
Kivotos Islet	90, 91
Kizliman Burnu	547
Klaro Islets	66
Klaros Bay	339
Kleithi, Mount	291
Klephti Point	98
Klides Islet	567, 570
Klima, anchorage	167
Klimo, Mount	156
Koan Point	189, 192
Kochini Bay	268
Kofinitha Islet	267
Koi Chai	575
Koioun Burnu	529
Kokala Burnu	327
—— —— Spit	327
Kokhilas, Mount	152, 156
Kokkino, Cape	568
Kokino Point	560
—— Pulo	305
—— Tower	C 644
Kokino Kastro	168
Kolembo, Mount	211
Kolissi, village	557
Kolokithia Bay	61, 62, 312
—— Gulf of	58
—— Port	309, 427
Kolova (Beacon) Rock—light	133
—— Rock	132
Koloyeri Rock	375
Kolumbos Bank	239
Koluri Bay	107, 108
—— Island	107
—— village of	107
Kombi Island	372
Kombi Point	372
Komi, Mount	376
Kondia, Port	378
—— village	378
Kondro Nisi	257
Kondros, Islet of	262
Konkhi, Mount	114
Konomata Xera	256
Kophino Mountain	437
Kopia Bay	77
Koppo Islet	555
Kopria, Cape	248
—— Islet	228
Koraka, Cape	84, 337
—— Islet	85, 170, 266
Korassiæ	303
Korax, Cape	219, 220
—— Mount	229
Kordion Bay	210
—— town of	210
Koreli Rock	292
Korghos Castles	550
Kormakiti, Cape	568, 569
Kormen Adasi	353
Koromboli, Mount	219
Kornos, Mount	569
Koro-nisi Islet	83
Korono, Mount	224, 228
Korphona, Mount	116, 117
Korpho, the	217
Korthion Bay	210
Koruni Head	140
Korykeion promontory	337
Korykos, Mount	337, 410
Kos Channel	284

Digitized by Google

	Page.
Kos, Gulf of	268, 271
—— Island	261, 270
—— town of	271
Kosma Point	115
Kosmo, Cape	210
Kotronas, town	61
Kotzikas Point	346
Kouris River	557
Kovari, Mount	209
Kovelo Bay	301
Kovo, Cape	420
Koyun, Cape	273, 274
Kranidi	85
—— port of	84
Kratzi Point	221, 226
Kremidara, Cape	62
Kremedi, Bay of	79
—— cape of	79
Krianaru Rock	131
Krikelos, Cape	231
—— Mount	229
Krio, Cape	269, 270, 445
—— Point	220
Kriphoghialia	349
Krithina, Mount	68
Kriumetopon	445
Kropia, Cape	248
Krum, Ras el	603
Kruso Islets	285
Kruvraike Bay	301
Ktenia Rocks	198
Ktima, town	556
Ktypa, Mount	142
Kubenova, Mount	57
Kubho Nisi	434
Kubi Islet	171
Ku Castle	384
Kuchi Islet	270
Kuchopata Shoal	306
Kuchuk Hanafort	399
—— Mendere	340
—— Sahib	319
Kudhu Island	368
Kudiya	463
—— Bank	464
Kudro Islet	294
—— Mount	223
Kujik Creek	532
Kuklijah Cliff	329
Kukura Point	345
Kulat esh Shukip	597
—— Shemma	599
Kulendi, point of	66
Kuluri Island	155
Kum Burnu	242, 248, 525
—— —— lights	526
Kumi	124
—— Bay	150
—— Harbor	150
—— town of	150
Kum Kale	391
—— —— castle	394
—— Point	271, 284
Kumlubek Bay	527
Kumuli, Mount	241
Kumur Baba	318
Kumuthi Islet	314
—— Point	314
—— Shoals	312, 314
Kunelli Islet	302
Kunithia Island	429
Kunupia	255
Kunupia Islet	256, 257
Kupho Channel	434
—— group	229
—— Islets	73, 228
—— Nisi	434
—— port	181
Kurekia Islets	252
Kurkula, Mount	64
Kuremena	433
Kurkula, Mount	58
Kurtumus Dere	400
Kurumblia, Mount	124
Kurupa Point	227
Kus Adasi	341
—— —— town	341
Kutri, Cape	445, 446
Kutala Bay	202
Kutri Reef	446
Kutzomiti Islet	256
Kuverta, Port	92
Kyamon Promontory	415
Kybleh Point	337
Kydonia	413
Kyphanta	79
Kyra Islet	102
Kyrenia Harbor	569–570
—— Islet	570
Kyriaki Point	300
Kyssus	314
Kythera, town of	73
Kythnos	202
—— Island	202

Digitized by Google

L.

Page.

Labert Ras..... 483
Lade Island..... 302
Ladhiko, Cape..... 245
Lagosa Islet..... 102
Lagussce Islands..... 389
Lahm el Hinar..... 465
Lakanas, Mount of..... 78
Lakida Point..... 196
Lake, Port..... 292
Lakonikos, Gulf of..... 58
Lalomeio Point—light..... 153
Lamas River..... 550
Lamberusa..... 126
Lamia..... 146
Landada, town of..... 231
Langada, Cape..... 231
Langeri Bay..... 221
Lara Point..... 555
—— Bay..... 246
Lardos, Cape..... 246
Larissa..... 81
Larmes, Port..... 143
Larnaka Bay..... 560
—— Port..... 561
Laro Rock..... 226
Laros Island..... 290
Larymno, Port..... 143
Lasethe..... 426
Lasethe Mountains..... 436
Latakiya..... 582, 583
Latmus..... 299
Latomeio Point..... 153
Latzi..... 568
Latzata, town of..... 336
Laura, Cape..... 180
—— —— current..... 180
Laurium..... 116
Lavrion Bay..... 118
Lazaret de Clazomenæ..... 323
Lazaretto Point..... 242
Leani Point..... 255
Lebanon Range..... 589
Lebannon Range..... 586
Lebedos Bay..... 339
Lebena, ruins..... 437
Lebida, village..... 456
Lebunia Island..... 264
Lectum..... 370
Lefka, town..... 568
Lefroy Patch..... 158
Leftere..... 188
Leftoro-Khori Cliffs..... 173
—— skala of..... 174
—— village..... 174

Page.

Legi Point..... 250
Legrana Bay..... 117, 138
Leiah Islet..... 366
Lekhonia, village..... 160
Lemnos Island..... 371
Leonidi, town of..... 79, 80
Leonidion, village of..... 85
Leon promontory..... 437
Leontes..... 597
Lepethymnus, Mount..... 354, 362
Lephki, Bay of..... 67
Lephko Islets..... 151
Leptis Magna..... 456
Lepto..... 285
Leros..... 291
Lero Island..... 291, 292
—— Strait..... 291
Le (*see also* proper name)..... 477
Leskla, Cape..... 161
Lethe, River..... 473
Lethtari Rock..... 164
Leukos Bay..... 140
Leueja Marsa..... 462
Levisi Bay..... 535
Lexitha Harbor..... 290
—— Islands..... 290
Lhessaly..... 173
Lloyd's signal stations..... 33, 122
Liadi Islets..... 231, 290
Liani Point..... 254
Liano Kavo..... 420, 421
Libiadha Bay..... 187
Libia (Tripoli)..... 50, 51
—— Government..... 51
—— Harbors..... 51
—— Products..... 51
Libnan, Jebel..... 589
Lifeboats..... 45
Ligata..... 456
—— Ras..... 456
Light List..... 10
Lights—distance..... 13
Likhades Islands..... 144, 145
—— Point..... 145, 147
Likiri, Lake..... 143
Likonta, Cape..... 462
Likorima Island..... 169
Liman..... 244
Limasol, town..... 558–559
Limeni, Port..... 62
Limiona Bay..... 129
Limniti, Cape..... 568
Limni, town of..... 145
Linaria Bay..... 288

Digitized by Google

Page.

Linaria Cove..... 153, 154
Lindo Islet..... 71
Linosa Island..... 529
Lindos, Cape..... 246
—— Mount..... 246
—— Port..... 246
—— town of..... 246
Liniko, town..... 198
Lintos Bay, shoal..... 267
Lipso Channel..... 292
—— Island..... 108, 292, 293
Lipsos Shoal..... 474
Lismoni Islet..... 363
Lithari Point..... 156
—— —— light..... 153
Little Burnt Isle..... 234
—— Hanafart Bay..... 399
Littino, Cape..... 438, 439
Livadhia..... 254
Livadia Bay..... 259
Livada Point..... 212
Livadhi, Port..... 201
—— village..... 201
Livantes Island..... 144
Laara Harbor..... 545
Lodo Islet..... 285
Lodos Point..... 370
Lombarda, peninsula of..... 116
Loney Bank..... 390
—— Rock..... 96
Long Island..... 320, 328, 528
—— Point..... 321
Longone Port..... 358
Longos, Cape..... 144
—— Port..... 537
Lorug Ras..... 458
Loryma, town..... 525
Losta Bay..... 266
—— Port..... 266
Loutros Bay..... 568
Low Islet..... 445
Lukka Cape..... 482
Lunguiz Point..... 274
Lutro, Mount..... 357
—— port of..... 441
Lutros, Cape..... 260
Lyriotiki, Point..... 66
Lyttus, harbor of..... 426

M.

Machaira..... 560
Madara Vuna..... 78, 407, 412, 441, 443
Madonna Island..... 258
Maeu Ras..... 458

Page.

Maestaro..... 509
Magnesian Promontory..... 156, 160
Magnetic disturbance of compass, local..... 25
Magpie Rock..... 284
Magra Masa..... 457
Mahatib, Ras..... 522
Mahmudiyeh Canal..... 501
Mainland Coast..... 313
Makariœ Isles..... 228, 229
Makhabez Ras..... 447
—— Bank..... 447
Makhæra..... 560
Makmel, Jebel..... 589
Makra Islet..... 240
Makra Nisi..... 304
—— Rock..... 240
Makria Punda..... 257
Makri Bay..... 363
—— Cape..... 264, 405
—— Gulf of..... 533
—— Harbor..... 75, 534
—— Hill..... 69, 74
—— Islet..... 75
—— Reef..... 118, 120
—— Yalo..... 249
—— —— Bay..... 250, 435
Makro Islet..... 126, 222, 315
Makronise Island..... 120
Makronisi..... 117
Makro Nisi Islet..... 252, 296, 299, 363
Makrokephalo, Cape..... 218, 219
Makrolo Islet..... 434
Maksada..... 509
Makrud Islet..... 585, 586
Makryno, Mount..... 57
Malagori Point..... 346
Malaki Cape..... 303
Malathria, Cape..... 372, 377
Malathro..... 285, 287
Malaxa Ridge..... 412
Malea Bay..... 426
—— Cape..... 58, 68, 69
Maletze, Cape..... 420
Malkeji River..... 339
Malkiar Bay..... 338
—— Head..... 338
Mal-tepeh Cape..... 354, 363
Maltezana Port..... 257
Mameltein, Ras..... 589
Manati Islet..... 415
Manavat..... 548
Manavgat Kalessi..... 545
Manavgat River..... 545

Digitized by Google

Page.

Mandelyah, Gulf of..... 287, 296
Mandili Islet..... 136
Mandraki..... 259, 260
—— Harbor..... 537
—— Islet..... 316
—— port of..... 91, 243
Mandri Channel..... 117
—— port of..... 119
Manganari Bay..... 234
Mani Peninsula..... 57, 61
Manola, village..... 236
Mansell Bank..... 370
—— Reef..... 236
—— Shoal..... 390, 392
Mantudion, Port..... 151
Marabut Islet..... 488
—— Pass..... 491
—— Reef..... 491
Marasch..... 572
Marathi Island..... 536
Marathona Bay..... 101, 123
Maratrokampo Bay..... 344, 348
—— village of..... 348
Marathus, ruins of..... 585
Marathussæ..... 322
Margariti Islet..... 309
Marina..... 561–562
Markhab Castle..... 584
Markaki Point..... 306
Markopoli..... 123
Markhab, Ras el..... 609
Marino Rock..... 165
—— town..... 582
Mar Ishaya, village..... 591
Maritza, Lake..... 403
Marmara Cape..... 383
—— Islet..... 263
—— Point..... 153
Marmarice, Cape..... 526
Marmari Bay..... 126, 127
Marmaric Harbor..... 244, 267, 527
Marmari Point..... 127
—— Port..... 57, 60
Marmarokopio..... 304
Marmaro, Port of, Islet..... 309
Marmora..... 219
Marmaro, Port..... 308
Marmora, Channel..... 153
Marmoron Bay..... 304
Marona, Mount..... 405
Mar Saman Monastery..... 589
Marsa. *See* proper name.
Martinis Bank..... 540

Page.

Mar Yakub..... 588
Mar Yusef el Burj Monastery..... 590
Maskula Point..... 199
Masogia, Bay of..... 411
Mastiff Bank..... 107
Mastiko, Cape..... 306, 307, 313
Mastusium Promontory..... 394
Matala, Port..... 439
Matapan, Cape..... 57
—— Mountain..... 57
Matera, wells..... 466
Matruh, Marsa..... 484
Matruh Reef..... 484
Mavrocordato Shoal..... 95
Mavro Island..... 389
Mavro Islets..... 290
Mavro Kavo..... 429
Mavromati Point..... 368
Mavro, Mount..... 57
Mavro Muri, Cape..... 415
Mavro Nisi..... 438
Mavro Vuni..... 116
Mavro Vuni, Bay..... 315
Mavrovuni, Cape..... 119, 121
Mavrovuni Point..... 62
—— Village..... 62
Maxwell Point..... 157
Mazes, town of..... 85
Mdura, Jebel..... 462
Meander..... 302
—— Point..... 302
Mean sea level..... 16
Measured mile beacons..... 97
Medawer, Ras bei..... 592
Medina Reefs..... 485, 487
Medina Rock..... 117
Meddro Chai..... 302
Medina es Soldan..... 462
Megali Limni..... 381
Megalo Bay..... 259, 311, 312
—— Island..... 125
—— Islet..... 139, 209
—— Kastron..... 422
—— —— town of..... 435
—— Likhades..... 146
—— Port..... 237
Megalonisi Islet..... 437
Meganoros Point..... 373, 376
Megara Bay..... 107
——, town of..... 107
Megarsus, citadel..... 554
Mekali..... 468
Melania, Port..... 548

Digitized by Google

Page.

Melanti Rock..... 229
Mela Point..... 383
Melas River..... 545
Melhaish, Umm..... 487
Melina, village..... 160
Melidoni Bay..... 71
Melisse..... 547
Melœna..... 318
Melo Point..... 384
Mendeli, Mount..... 124
Menelaus Harbor..... 480
—— Islet..... 480
Menimen Skala..... 331
Menites, village..... 250
Menzaleh Canal..... 521
—— Lake..... 512
Mercator chart..... 13
Merika, Port..... 203
—— Point..... 357
Merjed, Jebel..... 456
Merkez, village..... 575
Merkop..... 456
Merminga Rock..... 219, 361
Merminji, Cape..... 326
Merminji Rocks..... 326
Meronuli..... 235
Merόvuli..... 235
—— town of..... 235
Mersina..... 550
—— the town..... 551–553
Mersinjik Bay..... 270
Mersin, Port..... 336
Mesaria, village..... 348
Meshrik Point..... 282
Mesia Bank..... 265
Meso Islet..... 315
Messaria..... 202
—— Plain..... 436
Messanisi Islet..... 563
Messapus, Mount..... 142
Messara Bay..... 438
Messa Vuno, Cape..... 235, 238
—— —— Mount..... 235
Mesta..... 308
—— port of..... 307
Mestegna Cove..... 363
Metala, port of..... 439
Metamorphosa, monastery..... 345
Methana Channel..... 102
Methana Peninsula..... 97
Metopi Channel..... 101
—— Island..... 101
Mezetlu..... 550

Page.

Mezzo, point..... 88
Miasma..... 278
Miaulis, Cape..... 111
Middle Bay..... 425
—— Pass..... 373, 377
Mid Rock..... 356
Mill Creek..... 274
Mijella, port of..... 157, 161
—— town..... 157
Mikale..... 265
Mikra Point..... 177
Mikro Islet..... 167, 168, 202
—— Islets..... 88
—— Kaimeni..... 234, 237
—— Nisi..... 287, 436
—— —— Islet..... 428
—— —— Rock..... 428
—— Rock..... 389
Miletus..... 302, 303
Milianos, Cape of..... 85
Milos Island..... 195
Mimas, peak of..... 318, 328
Mina, Ras el..... 579
Minat-el-Kaban anchorage..... 582
Minerva..... 117
Mines..... 329
—— caution..... 394
Miniko Islet..... 264
Minoan, city of Knossos..... 422
Mirabella, Gulf of..... 426, 428
Mirango Island..... 163
Misea Reef..... 292
Miso Bay..... 215
Misocampo Bay..... 344
Mison Point..... 186
Misrata Ras..... 458
Missis..... 572
Mitata, village of..... 71
Mitelinous River..... 343, 344
Mityleni..... 354, 360
—— Channel..... 363
—— town of..... 354, 355, 362
Miniatika, Mount..... 57
Minma Point Light..... 145
Mlaga, Jebel..... 468
Modhi Islet..... 96
Molathi..... 103
Mollah Ibrahim..... 346
—— —— port of..... 345
Molino..... 242
Molino, Cape..... 361, 362, 369
—— Road..... 362
Molos, port of..... 90, 91

Digitized by Google

Page.

Monastery Bay..... 95
Monemvasia..... 65, 78
—— Cape..... 78
—— Islet..... 78
—— town..... 78, 79
Moni Island..... 101
Monks, the..... 138
Monodendri, Cape..... 301
Monolithoas, Cape..... 247
Monopetron Point..... 346
Monopodro Rock..... 196
Montar Hill..... 608
Monte Santo..... 184
—— —— Gulf of..... 175, 180, 181
—— —— Peninsula..... 183
Moordavan..... 270
Morea..... 67, 69, 78
Mordala Islet..... 270
Morghebet Point..... 273
Moro Islet..... 169. 171
Morphou Bay..... 568
—— town..... 569
Mortalik..... 573
Morto Bay..... 395
—— —— anchorage..... 396
Mosko Islands..... 364, 366, 368
—— Pulo..... 366
—— Road..... 366
Mothès, Mount..... 431
Mothoni Point..... 73, 74
Moulia Rocks..... 556
Mount. *See* proper name.
Mud stream..... 575
Mudros Bay..... 372
—— Port..... 372
Muia Islet..... 172
Mukata, Nahr el..... 601
Mukir el Khan..... 575–576
Muktar, Jebel..... 464
Muskakka, Jebel..... 599
Mulaos Point..... 64
Mulari Island..... 182
Mulke, village of..... 108
Multaranik, Ras..... 463
Mungri Point..... 225
Munychia..... 115
Murata, Mount..... 465
Murdubek Bay..... 273
Murtzephloas..... 380
—— Cape..... 380
Musa, Jebel..... 579
Muselim Channel..... 369

Page.

Muselim Rock..... 362
Muskat, Port..... 293
Mustapha..... 306
Mutar..... 464
Muti, Cape..... 167
Mutsoma Bay..... 228
—— Cape..... 228
Muzaki, Cape..... 90, 91
Mykale..... 303
—— Mount..... 342
Mykoni Channel..... 213
Mykonos Island..... 216, 217
Myli..... 81
Myli Point..... 271
Mylopatamo..... 69
Myndus..... 286
—— Rock..... 286, 296
Myrmikonisos Rocks..... 151
Myrtle Cove..... 336
Myrto Islet..... 136
—— Light..... 137

N.

Naes Foyes..... 351
Nagazi Stream..... 455
Nahim, Ras..... 462
Nahr Abu Ali..... 586, 588
Nahr Beirut..... 591
Nahr el Aasi..... 579, 580, 581
Nahr el Arka..... 584, 586
Nahr el Awali..... 595, 596
Nahr el Damur..... 594
Nahr el Kasimizeh..... 597
Nahr el Kebir..... 586, 590
Nahr el Sin..... 584
Nahr Ibrahim..... 590
Nahr Kebir..... 583
Nahr Litany..... 597
Nakura, Ras en..... 597, 599
Namurt Liman..... 352
Napoli Island..... 239
Napoli di Romania..... 81
Nata, Islet..... 208
Nauplia..... 81, 82
—— Gulf of..... 78, 80
Naussa, Port..... 220, 221
Nautilus Rock..... 76
Naval dockyards and establishments. 33
Navigation of the archipelago..... 41
Navos, south coast..... 227
Naxia Bay..... 225
——, plain of..... 225
——, town of..... 226

Digitized by Google

Page.

Naxos, east coast..... 228
—— Island..... 224
Naziki Bank..... 177
Neapolis, town..... 189
Nebi Beni Ismaileh..... 609
—— Khudar..... 581
—— Nuh..... 607
—— Samwil..... 607
——. *See* proper name.
—— Yunas..... 608
Negropont..... 124
Nehua Jebel..... 461
Nelson River..... 507
Nemborio Bay..... 262
Nenita, Cape..... 311, 312
Neo Kaimeni..... 236, 237
—— —— Islet..... 234
Nephri Point..... 290
Nera Islets..... 288
Nero Islet..... 302
Nestus, plain of..... 190
—— River..... 193, 406
Nevada, wreck..... 328
New Burnt Isle..... 234
—— moon..... 477
—— Troy..... 383
Niapolis, town of..... 67
Niebruniessi Point..... 399
Nies Bay..... 157
Niger, Cape..... 398
Nijekul, Cape..... 300
Nikaria..... 229, 304
—— Island..... 348
—— Passage..... 349
Nikia, village..... 260
Nikola Islet..... 419
Nikolaos Bay..... 349
—— Islet..... 148
Nikolo, Cape..... 180
—— Islet..... 428
—— Patches..... 374
—— Point..... 428
—— Port..... 428
—— Rocks..... 363, 428
—— Cape..... 153
Nikro..... 286
Nikrothikes Islet..... 286
Nikuria..... 230
—— Island..... 230
Nile, the river..... 508
Nimos Island..... 262, 265
Nimphi, Port..... 61
Nio..... 234

Page.

Nio Island..... 233
—— port of..... 233
—— Rock..... 234
Nisaki Islet..... 248
Niseros..... 259, 260
Nisia..... 291
—— Kalopothia..... 265
Nisida Islet..... 100
Nisizza Island..... 91
Nisyros..... 259
Nites, Mount..... 204
Nomenclature..... 29
North Aspra Isles..... 293
North Harbor..... 325
—— Islet..... 563
—— Point..... 348
—— Port..... 354
—— Shoal..... 490
Notice to Mariners..... 10
Nur Jebel..... 573
Nusairiyeh Range..... 586

O.

Obelisk Point..... 97
Oblivion River..... 473
Observation Islet..... 163
Ocean Rock..... 386
Octonia, Cape..... 150, 151
Octonya Nisi..... 247
Oglak Island..... 324
Oglu Dagh..... 297
Oil, use of..... 26
Okhendra Island..... 536
Okhi, Mount..... 124, 136
Olbia Harbor..... 544
Old Burnt Isle..... 234
Olivieri, Port..... 355
Olontia, port of..... 427
Olymbos, Mount..... 117
Olympus..... 568
—— Mount..... 172, 174, 354
—— city of..... 543
Ommanney, Cape..... 188, 191
Omja, Rasal..... 462
Oneah Islet..... 265
Onja, Rasal..... 464
Ophidusa Islet..... 255
Ophris, village of..... 252
Orak Island..... 281
Ordymno Point..... 361
Ordymnos, Mount..... 354, 359, 370
Oren Point..... 280
Oreos Bay..... 149

Digitized by Google

Page.

Oreos Channel..... 147, 148
—— plains of..... 124
—— Shoal..... 149
Orir..... 457
Ornos, Port..... 218
Oro, islet of..... 224
Orontes River..... 580
Oropos Bay..... 129
Oros Bay..... 154
—— Cape..... 154
Oros, Mount..... 100, 154
Orphourous Islet..... 555
Orta Burnu..... 530
Orta Point..... 265, 268
Ortholithi, Mount..... 83, 98, 112
Ossa, Mount..... 172, 173
Ovo Islet..... 73, 77
Ovo, Rock..... 425
Ovraeo Kalessi..... 339
Oxa Islet..... 262
Oxoburguo..... 212
Oxo Xera Shoal..... 256
Oryas, Port..... 122

P.

Pagania, Cape..... 62
—— Rock..... 62
Pagasæ..... 161
Pagasitikos, Gulf of..... 156
Pagus, Mount..... 332
Paida Bay..... 185
Pakhia Island..... 163
—— Islet..... 240
Paki Island..... 107
Palæo Kastro..... 380
Palaio Kastru..... 422, 433
—— —— Hill..... 433
—— Mendere..... 303
—— Pyrgos Point..... 100, 101
Palamida..... 91
—— Cape..... 269
Palamidi, fortress..... 82
—— ridge of..... 81
Palamo Islet..... 338
Palatia, ruins..... 249
Palatshah, Bay of..... 247
Paleo Kaimeni..... 234
—— Kastro..... 77, 251, 305, 386, 387
—— —— Point..... 305
—— Khediz Spit..... 327
—— Khori, town of..... 195
—— Monemvasia..... 79
—— Point..... 286, 287

Page.

Paleo, port of..... 79
—— Suda..... 415
—— Trikiri..... 159
Pallene, peninsula of..... 180
—— village..... 180
Pallikari Bay..... 70, 77
Palir Islet, or Rock..... 170
Paliuri Cape..... 175
Pamboulos, Mount..... 570
Pampakas, Cape..... 309
Panagia Creek..... 425
—— Island..... 190, 191, 193
—— Islet..... 294, 300, 342, 344, 345
—— Hill..... 231
—— Mount..... 382
—— Point..... 171, 326, 422
—— Road..... 190
Panaghia Islet..... 312, 313, 335
Panale Bay..... 291
Pandion Point..... 526
Pandros Islet..... 223
Panermo Bay..... 227
—— Cape..... 227
Pankosi Point..... 347
Paniero Harbor..... 262
Pannetone, Fort..... 457
Panomi Point..... 175
Panorimo Bay..... 118
Panormo, port of..... 166
Panormos..... 213
—— Nisi Islet..... 254
Panormos, Port..... 213, 218, 255
Panormrotes Monastery..... 262
Panormus Bay..... 301
—— Portus..... 421
Papas, Cape..... 229, 349
—— Islet..... 531
Papado Plaka Islet..... 438
Papadula Islands..... 548
Paphos Point..... 556
—— Port..... 556
Papu Islet..... 171
Paralimni Lake..... 143
Paramesa Point..... 314, 315
Parapanta, Port..... 309
Parapola..... 80
Parasiva, Mount..... 287
Paraspori, Cape..... 249
Parathis, Mount..... 382
Pardalos Point..... 159
Parœkia Bank..... 220
Parœkia, Port..... 219
—— town..... 220

Digitized by Google

	Page.
Parœtonium	484
Paros, Island	219
Parthani Bay	291
Parthena Islet	283
Parthenos, Cape	227
Pasara, town—rock	306
Paschiamo	429
Pasha Adasi Islet	131, 132
Pasha Bay	118, 296
Pasha Dere	400
Pasha Island	316, 317
Pasha Islet	260
Pasha, Port	317
Pasha Rock	118, 284
Pasha's castle	450
Paspargo Islets	312
Passages	41
Passage Island	527
Passalimani, port of	114
Pass. *See* proper name.	
Patara, port of	536
Patino	294
—— town	294
Pavlos, Cape	376
Patmos	294, 295
—— promontory	295
Patos Point	262
Paximada Islet	430
—— Rock	246
Paximadi	425
Paximadia, the	440
Paximadi Islet	531
Paximadion Islet	125, 127, 195, 197
Pedalo Bay	267
Pegadia Bay	250
Pegathi Point	118, 120
—— Rock	120
Pelago Island	162, 170
—— Channel	171
Pelalidi, islet of	231
Pelerissa Island	170
Pelican Spit	327
Pelid Islets	275
Pelinæus	306
Pelion, Mount	172, 173
Pelusium, bay of	521
Penarli Island	321, 322
Pendayia, village	569
Pendi Nisia Shoal	246
Peneus River	173
Pentadaktylo, Mount	570
Pentapolis	473
Pentilicus, Mount	124
Penzik, inlet	267, 268
Pephko Bay	154
Peponi Rocks	220
Perama Point	131
—— —— light	132
Perama Skala	356, 357
Perati, Mount	123
Perdika Point	101
Pergamos, port of	353
Perigusa	260
Peristeri Island	162, 168, 169
Peros Island	401
Pershendi	550
Peta Islet	325
Petalides	445
Petali, Gulf of	124
Petali Islands	125
Petaleitha-nisi	234
Petalitha, Cape	223
—— Rock	223
Petasa Bay	283
Petasi Cape	380
Petasi Islet	91
Petasi Ledge	380
Petasi Strait	90
Petera, Cape	284
Pethi Harbor	262
Petras Bay	357
Petras Islet	361
Petras, village of	361
Petries, Port	150
Petri Isle	67, 68
Petrite, Cape	107
Petrodi Point	260
Petro Islet	264, 384, 386
—— Karavi	295, 296
Petrokaravon	97
Petro Kargo Rocks	97
Petroma Reef	341
Petro Nisi	99
Petros	140
Phako, Mount	371, 372, 378
—— Point	372
Phalarus Island	526
Phalasarna, town of	446
Phalconera, islet of	80
Phalerum Bay	115, 115
Phana Bay	77
—— Kopia Bay	71
Phanari, Cape	234
Phanæ Islet	360
Phanar, Cape	349
Pharaklo, Cape	380

Digitized by Google

	Page.
Pharias Channel	292
Pharmako	301
Pharmakusa	301
Pharos, Port	489
Phaur Island	116
Phassa, Cape	137
Phida	390
—— Islet	389, 390
Phikas Point	220, 224
Philippi	189
Philistia	609
—— plains of	607
Phillippo, Cape	199, 200
Phineka Bay	541
—— Cape	541
Phineki Bay	251
Phinika, village	235
Phiniki, plain of	64, 65
Phleva Island	116
Phlini Rocks	240
Phodele Bay	421
Phoenicus	317
Phoenix, port of	441
Phokeo Nisia	255
Phokia Point	205
Pholegandros Island	232
Phoms	571
Phonias Islet	128
Photia Nisi	435
Phournaki Islands	536
Phourni Islet	570
Phrango Islet	292
—— Point	66
Phriano, Port	269
Phtilio, Port	157
Phundo Islet	126
—— Peak	127
Phurnos Bay	138, 139
Piadha	98
—— Bay	99
—— town	99
Piata Channel	153
Pigeon Islet	581
Pigeons	198
Pilaf Tepe	187
—— —— Mount	406
Pillars of Jonas	575
Pilotage	48
Piloting	23
—— Coast	24
Pilots	48
Pilot vessels, Lights	48
Pinaka, village	180
Pinnacle Point	266
Piperi Island	162, 171
—— Islet	202
Piræus	109, 110
Pirgo, Cape	157
Pisa, Port	121
Piskopi	202, 258
—— Head	259
—— Island	258
Pissouri Bay	557
Pitta Islet	285
Pithu Islet	159
Plagia Bay	258
Plaka Bay	440
—— Cape	100, 381, 433
Plakakia, Cape	100
Plaka, town of	79
Plakis	197
Plakoti, Cape	570
Plakusa Islet	292
Planedhi, Port	171
Planumi Islet	213
Platamona Point	174
—— Shoal	174
Platanimos, Mount	238
Platanio Bay	156, 165
Platani, village of	166
Platanos Rock	70
Platano, village	343
Plati	252
Platia Island	84
—— Islet	96, 102, 315
Platialos Bay	200
Plati, bank	358
—— Cape	186
—— Harbor	186
—— Island	153
—— Islet	151, 262, 264, 269, 353
—— Point	139
—— Port	379
Platæa Point	480
Plato Nisia	252
Platys Yalos Bay	200
Plero Islet	167, 287
Podia Rocks, north	155
—— —— south	155
Pogon, port of	96
Point. *See* proper name.	
Polais, Port	122
Polemos Bay	539, 540
Polino Island	197, 199
Polis village	568
Poloni Pass	198

Digitized by Google

Page.

Poloni Rock 198
Polyaigos Island 198
Polykandro Island 232
Polyphidous Island 537
Pomos Point 567, 568
Pondiko Island 317
—— Islet 339
—— Nisi 151, 156, 409
Pondiko Nisi—Light 151
Pondikusa Islets 286
Ponenti Point 383, 384, 391, 393
Pontiko-nisi Islet 91
Pontikutha Islet 254
Pontinus, Mount of 81
Population 30
Poretti Islet 76
Pori, Cape 172, 173
—— —— Islet 75
Poriki, rocks 66
Poro Bay Anchorage 427
—— Isthmus 427
Poros Bay 95
Poros Island 94, 95, 96
—— Harbor 96
—— Harbor Channel 95
—— town of 94
Portianos, village 375
Portis Islets 224
Port Milo 196
Porto delle Galere 243
Porto-Khelion 85
—— Leone 110
—— Lagos 406
—— San Antonio 372
Port. *See* proper name.
—— Said 513
—— —— approach 512
—— —— Africa Basin 514
—— —— coal— repairs — supplies— trade 520
—— —— lights 515
—— —— mooring buoys 517
—— —— Petroleum basin 514
—— —— pilots 516
—— —— quarantine 519
—— —— radio 521
—— —— signals 518
—— —— silt 519
—— —— the town 519
—— —— tides 515
—— —— time signals 520
Ports, list of principal 612
Poseidonia 401

Page.

Posidium Promontory 301
Posidium, ruins 581
Posidium Shoal 301
Potamos Point 358
Potamo, port of 76
—— town of 69, 75
Potidæa, Isthmus of 180
Potolemais 474
Prasiæ Island 123
Prasini 228
Prason, Cape 346
Praso Island 378, 536
—— Islet 126, 181, 218, 389
—— Nisi 116, 151, 250
—— —— Cape 247, 253
—— —— light 162
Prasson Islet 171
—— Mount 295
Prassudo Islet 151
—— —— light 151
Prassu Nisia Islet 434
Prasuda Islets 259
Praximada Islet 167
Presutha Islet 159, 160
Priene 303
—— ruins 342
Prinari Bay 525
Problaka Bay 182
Procopi Bay 226
—— Point 226
Prohibited Zone 320
Promiri, Cape 165, 172
Prophets Rock 108
Prophetes Elias 348
Prophylaki Island 356
Prosino, Cape 231
Provencal Island 548
Psakum Promontory 411
Psalis Point 197
Psamatus, Port 59
Psara Island 305, 306
—— Mount 152
—— port of 305
—— town of 305
Psarina Point—light 154
Psarometakhion Bay 202
Psathura Island 171
Pseremo Cove 286
—— village 286
Pserimon Bogazi 271
Pserimos Island 285
PsiliPoint 344
Psiloriti, Mount 420

Digitized by Google

	Page.
Psiloriti, Mountain	438
Psira	76
Psyra Islet	429
Psyttalia	108
Ptolemais	546
Puda, Cape	164
Puda, Cape, Shoal	165
Pulo Strait	87
Purnea Bay	380
Pureia Point	155
Purnea, Port	381
Purno, Cape of	81
Pyla, Cape	560, 561
Pyrgo	368
—— Bay	568
—— Bank	183
—— Cape	221
—— Mount	204
—— Point	137, 540
Pyrgor, Cape	102
—— town of	191
Pyrgo, tower of	183
Pyrgui Islet	198
Pyrgui Strait	199
Pyrrha Promontory	368
Pyxaria, Mount	124

Q.

Quarantine Breakwater	497
—— Point	135, 142, 591
Quarry Hill	337
Queen Olga Hill	158

R.

Rabbit Islands	383, 389, 394
Radio	32
Rakhia	260
—— Islet	260
Rakos Islets	318
Ramkine Islet	587
Ramil, Wad al	454
Raphtis Islet	123
Raphtis, Port	123
—— Pulo	123
Rashat Isle	544
Ras. *See* proper name.	
Rat Island	409
—— Isles	146
Red Islet	169, 298
—— Pea	533
Reef Rock	356
Rema Bay	353
Rematia Islet	214, 216
—— Little	216
Renas, Gulf of	265, 266
Rephulia Islets	294
—— the	293
Repi Islets	163
—— light	164
Research Rock	146
Retimo	419
Rheiti	108
Rhenea, Island of	213, 214, 215
Rhevituza Islet	107
Rhithymno	419
—— Bay	420
—— harbor of Light	420
Rhodes Island	241
—— northwest coast	248
—— town	242
Rhodussa	529
Rhosus, village	578
Refuge Bluff	62
Rigas, Cape	90, 91
Rigusa	260
Rihan, Jebel	597
Rikha Point	182
Riva, Cape	236
Rock Point	115
Rodia	422
Rosetta, mouth	507, 508, 509
—— to Damretta	510
Rotha Islet	531
Rowley Point	365
Roxo, Cape	127
Royal Oak Bay	425
Ruad Island	287, 584
Rubos Island	371
Rui, Cape	83
—— village	83
Rukana Islet	240
—— Islets	240
Rumeli	443
Rumelia	190
Rumeileh, Ras	595
Rum, Ras alem	485
Ruphani, Gulf of	187
Ruphugialos, Cape of	70
Rusa Bay	229
Russa, Cape	271
Russian Monastery	185
Russiko	184
Russo, Cape	286

Digitized by Google

S. Page.

Sabagli..... 582
Sabakat Bardowal..... 521
—— *See* proper name.
Sabbatiki, Cape of..... 80
Sabrata Marsa..... 449
Sahib, Port..... 319
Saida..... 595
—— town..... 596
Sailejik, Mount..... 368
Sailing directions..... 10
Saint Pantaleimon..... 184
—— *see* St.
Sairet Ben Ghisa..... 471
Sakal Tutan..... 575
Sakarkeya, Mount..... 353
Sakran Adalari Islets..... 353
Salambia River..... 173
Salamis..... 566
—— Bay..... 109
—— Island..... 107
—— Mount..... 114
—— Strait..... 109
Salaphto Nisi..... 102
Saloniki Bay..... 177
—— —— northwestern shore..... 177
—— city of..... 179
—— Gulf of..... 172
—— —— eastern shore..... 175
—— town..... 177
—— wreck..... 179
Salt River..... 128
Samaria, mountains..... 607
Sambra Cliff..... 486
—— Reef..... 486
Samo Pulo Islet..... 348
Samos Island..... 342, 344
—— —— and coast to northward.. 348
—— Strait..... 303, 344
Samsun..... 303
—— Dagh..... 302, 303, 342
—— ruins..... 342
Samothraki Island..... 398
Sanani..... 587
—— Islet..... 587
Sana, Mount..... 384
Sandama, Bay of..... 296
—— Peninsula..... 296
Sandarli, Gulf of..... 351
—— Harbor..... 353
Sanghia Mountain..... 57, 61
Sangrada Point..... 373, 374
Sanjak Kalessi..... 324, 329
—— Spit..... 328

Page.

Santa Anna Bay..... 218
—— Maria, Cape..... 58, 66
—— Panaghia..... 70, 75
—— *See* Sta.
—— Saphia..... 66
Santo, Cape..... 185
Santorin..... 235
—— Island..... 234
Saphlaurus, Mount of..... 78
Saphonidi..... 288
—— Islets..... 288
Saraceniko Bay..... 66, 67, 77
Sarakeniko, Cape..... 151
Saraki Islet..... 292
Sarakino Island..... 153
—— Strait..... 153
Saranta Bay..... 264
Saria..... 253
—— Island..... 249
Sari Nisi..... 290
—— Saklizeh..... 575
Saronikos, Gulf of..... 94
Sasa, Jebel..... 604
Scala..... 561
Scarpanto Island..... 249, 251
—— Strait..... 249, 253
Schœnus Bay..... 103
Scio Island..... 306
—— Port..... 310
—— town of..... 310
Scroponeri Mountains..... 142
—— Port..... 142
Sea temperature..... 37
Seal Island..... 480
Seddul Bahr..... 387
—— —— castle..... 394
—— —— village of..... 394
—— —— town..... 395
Sedikioi, village of..... 332
Sedukia Point..... 109
Seignelay Patch, Le..... 477
Sekertzek, Cape..... 351
Selata, Ras..... 589
Selefkeh, town..... 549
Selem, Jebel..... 455
Selevcia..... 579
—— Pieria..... 579
Selino Kastelli..... 444
Sellada, ridge..... 235
Semakh, Tell es..... 603
Sem, Ras..... 476
Sentinals group..... 539
Senu Nisi..... 257

Digitized by Google

Page.

Sepias Cape..... 164, 165
Serakhis River..... 569
Serik, Ras..... 456, 457
Seriphapulon..... 202
Seriphos Island..... 201
Serpho Channel..... 202
—— Island..... 201
Sersa, Port..... 263, 525
Sertsheh, Port..... 263, 525
Seskli Island..... 262
—— Strait..... 262
Sesklo, Cape..... 160, 161
Setif Rock..... 451
Sevedo, Port..... 537
Seven Capes..... 535, 536
Sevetila, Mount of..... 78
Seyut Bay..... 275, 279
Shahim Kalessi..... 395
Shag Islet..... 480
Shah-hin Burnu..... 272
Shamiyeh, Ras esh..... 592
Sharkea Rock..... 476
Sharon, plain of..... 604, 607
Sharp Peak..... 573
Sheffakhana, Fort..... 489
Shehir Oghlan Islands..... 275, 277
Sheifa, Jezirat abu..... 464
Sheikh Arduan..... 608
—— Jebel esh..... 597
—— Jabber..... 586
Sheiro Bay..... 298
Shimal Bank..... 384, 392
Shimahme Banks..... 487
Ship Rock..... 479
Shkeik Reef..... 487
Shoal Point..... 182
Shuka, Ras esh..... 587, 588, 589
Shuyun, Cape..... 272
Sibba, Lake..... 470
Sibun Shinel..... 450
Siderites Island..... 380
Sidero, Cape..... 309, 432
—— Island..... 357
—— Islet..... 431
—— Reef..... 432
Sidi Kreibish..... 473
—— *See* proper name.
—— Sima..... 473
Sidon..... 595
—— Papa..... 589
—— Paps..... 595
Sidra, Gulf of..... 459
Sidusa Island..... 360

Page.

Sidusa Islet..... 359, 360
Sigeum..... 394
Sighajik Bay..... 337
—— Harbor..... 337
—— Island..... 337
—— —— Reef..... 338
—— town of..... 338
Sighi Shoals..... 282
Signals to be made by vessels approaching ports..... 47
Sigri, Cape..... 359
—— Island..... 359
—— Port..... 360
—— village..... 360
Sikia, Cape..... 182
—— Port..... 182, 337
Sikinos..... 232
—— Island..... 233
—— village..... 233
Sikua..... 285
Silinti..... 547
Sillacca, village..... 202
Silpius, Mount..... 580
Silsili Point..... 506
Simbalu Cove..... 535
Simblo Rock..... 355
Sinus Beaticus, Bay..... 67
—— Opuntius..... 143
Siphano Channel..... 201
—— Island..... 199
Siphnos Island..... 199
Sipylus, Mount..... 331
Sirbon, Lake..... 521
Sirina..... 257
—— Island..... 257, 258
Sirte..... 461
Sithonia Peninsula..... 175, 180, 181
Sitia Bay..... 430
—— Cape..... 430
—— Peninsula..... 429
Sivriji Bay..... 370
—— Point..... 369
Skala..... 196
—— Nuova..... 341
—— —— Gulf of..... 303, 339
—— of Adamandos village of..... 196
—— Port..... 294
—— the..... 224
——, village..... 294
Skammia, Cape..... 362, 369
Skandilion..... 170
Skantzura Island..... 162, 170
Skaro, fortress..... 235

Digitized by Google

	Page.
Skathi, Mount	241
Skendiriotti, Cape	100
Skepe Reef	181
Skiathos Channel	164
—— Harbor	163
—— Island	162
Skilomango Island	101
Skilo Rock	262
Skinonda	257
—— Point	256
Skirometo Point	289
Skizo Bay	530
—— Burnu	529, 530
Sklavaki Isles, the	295
Sklaves, Mount	295
Skopea Bay	532
Skapelos Bay	166
—— Channel	167
—— Islands	162, 165
——, town of	166
Skopia, Mount	371, 380
Skrophes Bay	301
Skutari Hill	62
—— Port	62
—— town	62
Skylax Rocks	380
Skyli, Cape	93
Skyllaion, Cape	93
Skyropulon Island	154
Skyros	153
—— Island	152
—— town	155
Slata, Mount	300
Sleiman el Farsi	607
Smith Point	158
—— Shoal	390, 392
Smyrna, anchorage	330
—— city of	332
—— Gulf of	319
—— —— north shore	324
—— —— south shore	324, 329
—— Harbor, north shore	328
—— inner harbor	330
—— regulations	330
—— submarine mining	330
Snake Island	276
Softa Kalessi	547
So Kastro Islet	250
Sokoro, Port	293
Soldan, Ras	462
Sollum, Gulf of	482
Sophia, Cape	103
Sophiko, Port	99
Sophrana Nisia	253
Sotara, Ras	454
Soteri, Cape	380, 381
Sotiros, village	192
South Aspra Isles	293
—— Bay	598
Southeast Islet	541
South Harbor	326
—— Islet	250, 541
—— Port	354
Spada, Cape	411
Spalmatori Channel	316
—— Islands	312
Spanish Fort Light	450
Spano Islet	122
—— Point	258, 291
Sparta	62
—— Point	103
Spartan Reef	603
Spartea Cove	416
Spathi, Cape	68, 70, 74, 122
Spetsai Island	87
Spetsopoulon	87
Spezzia Island	87
—— Pulo	80, 87
—— town of	87
Sphæria, peninsula of	94
Sphakia Bay	440
—— town of	441
Sphena Burnu	531
Sphuri, Cape	286
Spilia, Cape	147
Spinalonga	427
—— Cape	426
—— Harbor	426
—— town of	435
Spiridioni Rocks	224
Spitfire Banks	370
—— Rock	431
Sponge fishery	287
—— Reefs	434
—— Rock	285
Spratt, Cape	300
—— Point	183
Square Rock	356, 426
St. Andrea Bay	255
—— Islet	198
St. Angelo, Cape	58, 69
—— tower	244
St. Anna Bay	229, 230
St. Ann, Mount	121
St. Apostola Island	297, 301
St. Apostoli Islet	371

Digitized by Google

Page.

Sta. Marina..... 291
—— —— Port..... 291
Stag Islet..... 445
Stakida..... 253
Staktoroya..... 102
Stalida Islet..... 114
Stalimeni Island..... 371
Stalliman Creek..... 454
Stamphalia..... 234, 253, 254
—— Northeast Coast..... 255
—— Northwest Coast..... 255
—— Southeast Coast..... 255
Standard time..... 33
Standia Island..... 424
—— Islet..... 425
Stanko Island..... 270
Staphilis Bay..... 166
—— Point..... 166
Stapodia Islet..... 219
St. Artemios..... 221
Statue Island..... 123
Staueo, Cape..... 228
Stavri, Cape..... 62, 63
Stavro Island..... 89, 532
—— Rock..... 89
Stavronisos Island..... 89
Stavros, Cape..... 148, 149, 378, 421
—— Mount..... 162
—— Point..... 187
—— Port..... 295
Stavrovouni, Mount..... 561
Stazousa Point..... 570
Steering commands..... 48
St. Elia Point..... 67
—— Rock..... 68
St. Elias..... 294
—— convent..... 603
—— Island..... 540
—— Mount..... 57, 199, 219
St. Elmo, Fort of..... 243
Steli Point..... 197
Steno Pass..... 132, 210
—— Point..... 209
—— port of..... 98
Sterneck Deep..... 248
St. Eustache Islet..... 198
St. George..... 580
—— Bay..... 591
—— —— wrecks..... 590
—— d'Arbora..... 94
St. Georgio..... 143
—— Island..... 94, 324, 536
—— mount of..... 73

Page.

St. Georgio Point..... 282
—— Islet..... 167, 168, 198, 217, 218
St. Helena, Cape..... 311
Stinangali Bay..... 154
Stivi Bay..... 378
—— Mount..... 378
St. John, Cape..... 203, 426
—— the Divine monastery..... 294
St. Kiriaki Island..... 532
St. Lassi Bay..... 99
St. Marina Bay..... 102
—— Cape..... 97
—— Island..... 97
St. Marino, Mount..... 355
St. Nicholas Islet, light..... 144
St. Nikola, Cape..... 308
—— Islet..... 375
St. Nikolaos, Port..... 121
St. Nikolas..... 211
St. Nikolo Bay..... 73, 77
—— Cape..... 307
—— Island..... 157, 535
—— Island, Port Mijella..... 161
—— Islet..... 228
—— Point..... 342
—— port of..... 69, 74, 117, 121
Stokes Bank..... 370
St. Paul Islet..... 437
St. Peter, castle..... 282, 283, 330
St. Phokas Bay..... 154
Straight Boghaz Pass..... 492
Strait. *See* proper name.
Strati Island..... 371
Stratoni Bay..... 186
Stratonisi..... 89
Stratoni, town of..... 186
Streblos Islet..... 384
Strymon River..... 187
Strongilo Islet..... 89, 146, 434
—— Islets..... 71
—— Nisi..... 251, 252
Strongyli..... 261
—— Island..... 223
—— Islet..... 146
Strongylo..... 167
—— Cape..... 128
—— Island..... 223
—— Islet..... 170, 228
—— Mount..... 225
Strovilo Islet..... 309
Struma River..... 187
Strutzina Mountain..... 142
St. Savos, Mount..... 122

Digitized by Google

	Page.
St. Sergios	566
St. Stephano Islet	309
St. Stephanos, Port	203, 540
St. Strati, village	371
Stura Bay	128
—— group	128
—— Island	128
St. Vincent Shoal	83
St. Yeorgiou Island	555
Stylida	146
—— town of	147
Subela Peninsula	532
Submarine bells	15
—— spring	99
Suda, Bay of	415
—— Islet	416
—— Point	416
—— village	418
Sudsuro Bay	436
Suez Canal	521
Suffren Shoals	383, 392
Sugutlu River	572
Suia Bay	444
Sulphur, Gulf of	459
Sultana Tekeh	560
Sultan Shoal	507
Sumt, Wadi	608
Suna Bay	364
—— Point	364
Sunion	117, 118
Sunk Rock	266, 267, 534
Sunnin, Jebel	589
Superbe Rock	220
Supia Island	92, 93
Sur	597
Surafend, Ras	595, 597, 599
——, village	604
Surbiotika River	158
Surbi, Port	157, 158
Sur Island	597
—— Peninsula	598
—— town	598
Susaki Point	103
Susa, Marsa	476
Suvalla, Mount	146
Suvela Burnu	531
—— Mount	531
Suvla Bay	399
——, Cape	399
Suweidiya, village	580
Swan Spits	328
Syhun Chai	553
Symi Bay	262
Symi, Gulf of	263
—— Harbor	261
—— Island	261
—— town of	261
Syra Harbor	206
—— Island	204
—— town	204, 206
Syria	55
—— communications	55
—— Harbors	55
—— trade, etc	55
Syros Island	204

T.

Tabia, Ras al	456, 457
Tabor, Mount	601
Tacohan Adasi	389
Taham Altee	279
Tahun ta Ria	472
—— —— Ras	471
Taifa Rock	483
Tajura Ras	454
Takhtalu, Mount	543
Talanta Channel	142
—— —— northeast shore	145
Talbot Reef	600
—— Rock	384
Talian, village	383
Talikna Point	373, 375, 376
—— town	375
Tamelos, Cape	121, 122
Tamera, Cape	142
Tank Point	480
Tanub Reef	486, 488
Tantura, village	604
Tarandakia Island	298
—— Islets	297
Tarandos	297
—— Island	298
Tares	587
—— Islet	587
Tarhuna Jabel	455
Tar Point	385
Tarrant Cove	372
Tarsus, town	553
Tartarus Bank	583
Tartus	584
Tasli Burnu	352
Tathuro nezgla	286
Tatila, Ras	459
Tatli Su	364
Taudi Dagh	571
—— Range	573

Digitized by Google

Page.

Taukra..... 474
—— city of..... 474
Taurus..... 572
Tavates Island..... 336
Tebruk, marsa..... 481
Tekeh, Cape..... 394
Tekir Point..... 269, 270
Tekies Point..... 135, 142
Tekrova Peninsula..... 543
—— town..... 543
Telegraph..... 32
Teleio Point..... 168
Telendo Channel..... 288
Telendos Island..... 288
Telethrium, Mount..... 145
Tel or Tell. *See* proper name.
Telos Island..... 258
Temperature..... 41
Tenda, Port..... 431
Tenedos Channel..... 385
—— Island..... 371, 383, 391, 394
Teos Bay..... 338
—— ruins..... 338
Tersaneh Adasi..... 532
Tershaneh Harbor..... 242, 243, 244
Tersus Chai..... 553
Teseremi Rock..... 286
Teyonas, Ras..... 468
Thascoli, Cape..... 371
Thaso..... 190
—— Island..... 188, 191
—— Pula..... 190
—— Strait..... 190
Theapori Point..... 291
Themina..... 304, 349
Themistocles, Cape..... 111
Thermopylæ..... 147
Theodoro Islet..... 412
—— Point..... 107
Theologos, Cape..... 143
—— Mount..... 143
Theopori..... 303
Thera..... 237
—— Island..... 234
Therasia Island..... 236
Thera, town of..... 235
Therison Ridge..... 412
Therma, Cape..... 145
—— Mount..... 371
Thermia Channel..... 202, 204
—— Island..... 202
Thermisi, Cape..... 92
Thermoni Rocks..... 77

Page.

Thessalian Islands..... 162
Thessalonika..... 179
Thessaly..... 162
Thevates, Cape..... 379
—— Islets..... 379
Thiakion Point..... 209
Thiaspori..... 266
Tholari, village of..... 231
Thorussa Island..... 101
Thremona Bay..... 292
Three-foot Rock..... 274
Thynni, Cape..... 84
Tidal streams..... 16
Tides..... 15, 44
Tide Tables..... 10
Tigani, Cape..... 378
—— Peninsula..... 410
—— Port..... 345
—— Rock..... 378
—— village..... 345
Tilo Island..... 258
Tilos, village..... 258
Timber Quays..... 490
—— —— Breakwater..... 497
Tineh Mouth..... 521
—— Bay of..... 521
Tinos..... 211
—— Harbor..... 212
—— Island..... 211
—— ports of..... 212
Tin Palace, Ras el..... 489
Tir, Ras et..... 590
Titalita, Port..... 458
Tityrus Mountains..... 411
Tolmeita..... 474, 475
Tolon Island..... 83
—— port of..... 83
—— Rock..... 83
Tomari, Cape..... 362
—— Islands..... 362, 365
Tomat Niha..... 589, 595
Tomb Island..... 276
—— Rock..... 477
Topolias, Lake..... 143
Tower of Lions..... 587
Trago Island..... 295
—— Islet..... 126
Tragonera Islet..... 536
Trago Nisi Islet..... 103
—— Reef..... 295
—— Rocks..... 315
Tragoon Island..... 126
Tragusa..... 248

Digitized by Google

Page.

Tragusa Islet..... 248
Traili, Cape..... 99
Trajanopolis..... 547
Trakhili, Cape..... 72
Trakhyli, Cape..... 99
Trakhylion, Cape..... 72
Trakhyta Head..... 205
Trako Head..... 182
Trambeto Islet..... 262
Tranisa Point..... 411
Trapho Islet..... 438
Trebuki, Port..... 153
Tree Peak..... 387, 394
—— Point..... 380
Trelo Vuni..... 116
Trianda Bay..... 242
Trianesia Islands..... 543
Tria Nisia..... 257
—— —— Islet..... 151
Tribune Rock..... 321
Trigono Islet..... 229
Trikeri Group..... 89
—— Island..... 89
—— Shoal..... 86
Trikiri, anchorage..... 156
—— Channel..... 156
—— Harbor..... 159
—— Peninsula..... 156, 159
—— Point, light..... 159
—— town..... 149
—— village..... 156
Trikkeri Point, light..... 159
Trinisi..... 64
Triopium..... 267
—— Promontorium..... 269
Trio Point..... 222
—— Port..... 221
Tripetro Point..... 221
Tripiti..... 197
—— Cape..... 120, 236, 412, 443
—— Islet..... 292
—— Rock..... 118, 120
Tripoli..... 586, 588
—— harbor of..... 450
—— Old..... 449
—— Roads..... 587
—— town of..... 453
Trireme Harbor..... 269
Tristoma Harbor..... 250
Tristomon, Port..... 153
Tristomos Harbor..... 540
Tritispela..... 306
Trogilium Promontory..... 303, 342

Page.

Troodas, Mount..... 568
Trypa Rock..... 205
—— Shoal..... 205
Tsamados Shoal..... 159
Tsimova, town..... 62
Tugh Burnu..... 538
Tumulus, the..... 392
Tunny fisheriers..... 45
Turba..... 477
Turbul, Jebel..... 586, 589
Tur, Jebel..... 601
Turk Islet..... 375
Turko, Cape..... 317
Turla Bay..... 217
Turleta Islet..... 139
Turliti Islet..... 211
Turlo, Cape..... 97, 100, 217
—— Rock..... 224
Turna Islet..... 223
Turusi Pulo..... 306
Tuz Burnu..... 364
Tuzla..... 418
—— Burnu..... 352
—— Point..... 176, 319
—— River..... 370
Twin Peaks..... 64
Two Brothers..... 324
—— Fathoms Rock..... 271
Tyn, et Ras..... 479
Tzerigo, town of..... 69
Tzai Agzi, anchorage..... 173
—— —— village..... 173
Tzor Kersah, Jezirat..... 478
Tzorzi Kalessi..... 353

U.

Uch Chatal..... 273
Ugra Marsa..... 457
Ujek Tepe..... 387
Um or Umm. *See* proper name.
Ummrakum, Marsa..... 483
—— Reef..... 483
Unia Nisia..... 253
Utch Islets..... 318
Utch-keucheh, Cape..... 352
Utchian Islet..... 282, 284

V.

Vagi, Cape..... 428
Vagli Cove..... 304
Vahyah, Cape..... 245
Vaie Inlet..... 255
Valanidhi, Cape..... 371

Digitized by Google

	Page.
Valava Island	154
Valaxa Island	153
Vale of Tempe	173
Vani, Cape	197
Vardar Bank, buoy	177
—— River	175
—— Spit	176
Varelia, Port	159
Variation of compass	25
—— —— change in	25
Vari Bay	116
Vasiliana, Cape	147
—— light	148
Vasilika Bay	281
—— Cape	281
Vasiliki Point	285
Vasiliko, Port	169
Vasilli River	58, 64
Vathi Channel	101
—— Cape of	79
—— Port	148, 289, 346, 536, 537
—— town of	347
Vathudi, Port	160
Vathy, Port	59, 200, 229, 230, 232, 255
Vathya, Islets of	130
Vatika Bay	66, 67, 77, 290
Vaton Island	317
Vavilas Point	569
Velani Point	123
Velona Islet	291
Venetiko Islet	307
Ventza Islet	89
Venus Bank	172
—— Temple of	100
Vernon Reef	600
Vespasian Shoal	176
Vevaronda Bay	84
Viano, town of	436
Victorieuse Rock	488
Viglio, Mount	415, 416
Viglika Bay	245, 246
Vikla	570
Village stream	575
Vilostasi, Cape	205
Vilostasion, Cape	205
Vincent Point	157
Vistritza River	174
Vlikos Islet	91
Vlykadion Point	197
Volisso	307
—— Road	308
Volo Channel	156
Volo, Gulf of	156
—— —— eastern shore	159
—— port of	160
—— town of	160
Volos Island	536
Volpe, Cape	263
Voria Kastro	381
Vorlovu Bay	144
Vourlah Road	321
—— Skala	323
Vourlia Bay	84
Voutzaki Rocks	536
Vovi Rock	139
—— Shoal	139
Vrisaki Bay	119
—— Point	119
Vrisen Punda	257
Vromo Limni Point, light	144
—— Passage	146
—— Port	337
—— village of	98
Vrulidhi Bay	373
—— Point	372
Vrulidia, Cape	309
Vrykolakonisia Rocks	155
—— Spit	155
Vudhi, Cape	245
Vuliasmeni Bay	116
Vuni Point	210
Vunos Island	264
Vurgounda Point	250
Vurkos Bay	132
—— Cape	357, 358
Vus Islet	202
Vuthia Peninsula	250
Vythi Rock	75

W.

Waaila Trum	477
Wad or Wadi (*see also* proper name)	463
Wad al. *See* proper name.	
Wedge	335
—— north and south	326
Weights and measures	31
Wellings Point	191
West Cape	400
—— Pass	527
—— Coast, Cape Phassa to Gavrion Bay	137–140, 209
—— Pass	374, 377
White Crag Hill	356
—— Mountains	407

Digitized by Google

	Page.
White Mountains of Crete	78
—— squalls	36
Winds	34
—— and weather	58
—— —— coasts of Libia and Egypt	37
—— —— —— of Cyprus	39
—— —— —— Karamania	39
—— —— —— Syria	40
Windmill Hill	306
Wreck Rock	257, 296

X.

Xanthus	536
Xerata Kargan Adasi Reef	341
Xera Chukanarlu Bay	306
Xerathia Cava	306
Xero Island	125
—— Kambo	292
—— Khori	124
—— Mikro	401
—— Pass	127
—— Punda	351
—— Skopelo	401
—— Vuni	143
—— Potamos, monastery	186
Xeros, Cape	400
—— Gulf of	399
—— Islands	401
Xerxes Canal	183
—— Isthmus of	183
Xingi Islet	339
Xiphorima Point	300
Xyli Bay	65
—— Peak	63–64

Y.

Yafa	605
—— town	606, 607
Yalanghi Burnu	341
Yali	260
—— Bay	540
—— Island	260
Yanar Volcano	543
Yani Khediz Spit	327
Yanisada Islet	430
Yanisades Islets	430
Yanni Bay	221
Yarf el Wasat	506
Yasajah Island	322
Yavales Islets	263
Yebna	607
Yedi Atala Islets	273
Yediskari Island	349
Yelu Islet	275
Yeni Kale	324
—— Shehr	394
—— —— Bank	391
—— —— Cape	391
—— —— village	394
Yeni-kioi, town of	400
Yenikli Liman	400
Yenupa, Cape	295
Yeranos, Cape	295
Yeronda Creek	541
Yilanejah	321
—— Island	322
Yilani Island	322
Yolkas Point	161
Ypsoparago	375
Yudi, Ras al	458
Yukyeri Bay	385
—— Point	386, 395
—— Shoals	386
Yuvalaki Chai	530

Z.

Zaar, Ras al	457
Zabak Marsa	460
Zafran Marsa	461
Zagora, village	173
Zakro Bay	433, 434
—— Shoal	433
Zanthe, Mount	406
Zarat Islet	475
Zavitsa, Mount of	78
Zea Channel	121
—— East Coast	122
—— Island	121
—— port of	114
— - town	121
Zeitani, Port	347
Zeitin, Cape	355
Zeitun, Gulf of	146, 147, 148
Zephirium	486
Zephyrion	478
Zephyrium Promontory	549
Zephyros Point	197
Zephyr Rock	197
Zerafeh, village	460
Zerid Rocks	460
Zervi, Cape	116
Zevgari, Cape	557
Zia, Mount	224
Ziaret, Ras	582, 583
Zib, village	600

Digitized by Google

	Page.
Zier-tem Nahr	591
—— —— Island	590
Ziliten	457
—— village	457
Zingheli	158
Zobolo Point	68
Zodoki, Mount	346
Zogria Island	163
Zogriaki Island	163
Zoluphi, Cape	295
Zoraik, village	458
Zorug	458
Zoster, Cape	116
Zovollo Point	68
Zuaga, Port	449
Zuara	448
—— Oasis	448
Zurafa Rock	398, 404
Zurva, Cape of	91
Zuzra Mezrata Islet	480
Zygren	486
Zyyi	560

Digitized by Google

Digitized by Google

SAILING DIRECTIONS, MANUALS, AND TABLES

PUBLISHED BY THE

UNITED STATES HYDROGRAPHIC OFFICE.

NOTE.—The only books sold by the Hydrographic Office are listed below. Other nautical publications must be obtained from the department of the Government by which they are published, or from the Superintendent of Documents, Government Printing Office, Washington, D. C.

Catalogue No.	Title.	Price.
	SAILING DIRECTIONS.	
	NORTH AND SOUTH AMERICA, WEST INDIES.	
73	Newfoundland and Labrador. Third edition. 1909	$1.00
100	Gulf and River St. Lawrence. Third edition. 1908	1.00
99	Nova Scotia Pilot. Bay of Fundy, coasts of Nova Scotia and Cape Breton Island. Fourth edition. 1916	.90
128	West Indies Pilot. Vol. I. Bermuda Islands, Bahama Islands, and the Greater Antilles. First edition. 1913	.60
129	West Indies Pilot. Vol. II. Lesser Antilles and Coast of Venezuela. First edition. 1914	.60
130	Central America and Mexico Pilot (East Coast). From Gallinas Point, Colombia, to the Rio Grande. First edition. 1916	.90
172	South America Pilot. Vol. I. (East Coast.) From the Orinoco to the Plata River, including the latter and its principal tributaries. First edition. 1916	.90
173	South America Pilot. Vol. II. Southern part from the Plata River on the east coast to Corcovado Gulf on the west coast, including Magellan Strait and the Falkland, South Georgia, and South Shetland Islands. First edition. 1916	.90
174	South America Pilot. Vol. III. West coast from Corcovado Gulf to Panama, including off-lying islands. First edition. 1916	.90
84	Mexican and Central American Pilot (Pacific Coast). From the United States to Colombia, including the Gulfs of California and Panama. Fourth edition. 1915	.60
175	British Columbia Pilot. Vol. I. Strait of Juan de Fuca to Cape Caution, including Vancouver Island and inland passages. First edition. 1916	.90
176	British Columbia Pilot. Vol. II. Cape Caution to Portland Canal, including the Queen Charlotte Islands and Dixon Entrance. First edition. 1916	.90
	CHINA, JAPAN, EAST INDIES.	
122	Asiatic Pilot. Vol. I. East Coast of Siberia, Sakhalin Island, and Korea. First edition. 1909	.45
123	Asiatic Pilot. Vol. II. The Japan Islands. First edition. 1910	.60
124	Asiatic Pilot. Vol. III. Coast of China, Yalu River to Hongkong, and Island of Formosa. First edition. 1909	.60
125	Asiatic Pilot. Vol. IV. Singapore Strait to Hongkong. First edition. 1915	.90
126	Asiatic Pilot. Vol. V. Sunda Strait and the Southern Approaches to China Sea, with West and North Coasts of Borneo and off-lying dangers. First edition. 1915	.90

Digitized by Google

Catalogue No.	Title.	Price.
	SAILING DIRECTIONS—Continued.	
	CHINA, JAPAN, EAST INDIES—continued.	
162	Asiatic Pilot. Vol. VI. The coasts of Sumatra, the West Coast of the Malay Peninsula and Singapore Strait. First edition. 1916. (In preparation.)	
163	East Indies Pilot. Vol. I. First edition. 1916.	
164	East Indies Pilot. Vol. II. The island of New Guinea; Arafura, Banda, and Molukka Seas, and the islands lying between Celebes and Mindanao. First edition. 1916	$0.90
165	Pacific Islands Pilot. Vol. I. Western Groups. First edition. 1916	.90
166	Pacific Islands Pilot. Vol. II. Eastern Groups. First edition. 1916	.90
	EUROPE.	
144	British Islands Pilot. Vol. I. South Coast of England and the English Channel. First edition. 1915	.90
149	British Islands Pilot. Vol. VI. The Faroes, Shetlands, and Orkney Islands, and the North and East Coasts of Scotland. First edition. 1915	.90
150	British Islands Pilot. Vol. VII. East Coasts of Scotland and England from Fife Ness to North Foreland. First edition. 1915.	.90
136	Norway Pilot. From Feje Fiord to North Cape, thence to Jacob River. First edition. 1915	.90
140	Scandinavia Pilot. Vol. I. Bergen to the Kattegat. First edition. 1915	.90
141	Scandinavia Pilot. Vol. II. Kattegat to Cape Arkona, including The Sound, Great and Little Belts, and Kiel Bay. First edition. 1916	.90
142	Baltic Pilot. Vol. I. The Baltic Sea. First edition. 1916. (In preparation.)	
135	North Sea Pilot. Eastern Shores from Dunkerque to the Skaw. First edition. 1915	.90
132	North Coast of France Pilot. Ushant to Dunkerque. First edition. 1915	.90
133	Bay of Biscay Pilot. Ushant to Toriñana. First edition. 1915.	.90
134	East Atlantic Pilot. The West Coast of Spain and Portugal from Cape Toriñana to Cape Trafalgar, North Atlantic Islands, and coast of Africa from Cape Spartel to Cape Palmas. First edition. 1916. (In press)	.90
151	Mediterranean Pilot. Vol. I. Gibraltar Strait, Coast of Spain, African Coast from Cape Spartel to Gulf of Gabes, and the Balearic Islands. First edition. 1916	.90
152	Mediterranean Pilot. Vol. II. The coasts of France and Italy to the Adriatic, including the Tuscan Archipelago, Corisca, Sardinia, Sicily, and the Maltese Islands. First edition. (In preparation.)	
154	Mediterranean Pilot. Vol. IV. From Cape Matapan (Greece) eastward, the Archipelago, and the southern shore of the Mediterranean eastward of Ras-Ashdir (Libia). First edition. 1916.	.90
	AFRICA.	
105	Africa Pilot. Vol. I. From Cape Palmas to Cape of Good Hope. First edition. 1916. (In press)	.90
156	Africa Pilot. Vol. II. From Cape of Good Hope to Ras-Hafun. First edition. 1916. (In press)	
157	Red Sea and Gulf of Aden Pilot, including the Suez Canal, Sokotra Island, and the Arabian coast to Ras-al Hadd. First edition. 1916. (In press)	.90

Digitized by Google

Catalogue No.	Title.	Price.
	SAILING DIRECTIONS—Continued.	
	INDIAN OCEAN.	
159	West Coast of India Pilot, including Ceylon, the Maldive and Laccadive Islands. First edition. 1916. (In preparation)...	$0. 90
160	Bay of Bengal Pilot, including Andaman and Nicobar Islands. First edition. 1916. (In press)	. 90
161	South Indian Ocean Pilot for the islands westward of longitude 80° east, including Madagascar and the Comoro Islands. First edition. 1916. (In press).....	. 90
	LIGHT LISTS.	
30	Lists of Lights. Vol. I. The West Indies and Pacific Islands and Coasts of North and South America, excepting the United States. 1916.....	. 60
31	List of Lights. Vol. II. South and East Coasts of Asia and Africa and the East Indies, Australia, Tasmania, and New Zealand. 1916	. 60
32	List of Lights. Vol. III. West Coast of Africa and Europe, and the Mediterranean Sea, including the Adriatic and Black Seas, and Sea of Azov. 1916.....	. 60
	MANUALS, TABLES, ETC.	
9	American Practical Navigator. Originally by Nathaniel Bowditch, LL.D., etc. Revised 1914. (Including the "Useful Tables").....	2. 25
9:II	Useful Tables from the American Practical Navigator. (Being Part II of No. 9).....	1. 25
71	Azimuth Tables, giving the True Bearings of the Sun at Intervals of Ten Minutes between Sunrise and Sunset, for Parallels of Latitude between 61° N. and 61° S. 1909. (Can also be applied to the moon, planets, and stars as long as their declinations do not exceed 23° N. or S.).....	1. 00
87	International Code of Signals. 1915.....	1. 50
103	Submarine Cables. 1892.....	. 30
107	Wrecks and Derelicts in the North Atlantic Ocean, 1887–1893, inclusive. 1894.....	. 10
114	Contributions to Terrestrial Magnetism. 1897.....	. 30
117	Table of Distances. 1916. (About 8,000 shortest navigable distances between ports).....	. 15
120	The Azimuths of Celestial Bodies Whose Declinations Range from 24° to 70°, for Parallels of Latitude Extending to 70° from the Equator. 1907.....	1. 50
127	Star Identification Tables, giving simultaneous values of declination and hour angle for values of latitude, altitude, and azimuth ranging from 0° to 80° in latitude and altitude and 0° to 180° in azimuth. 1909.....	. 75
131	Cuban Longitude Report of 1911–12.....	. 10
171	Line of Position Tables. 1915. (This is a book of 183 pages prepared with the special aim of presenting in the order in which they are used in practice, all the navigational and mathematical tables, except those of the Nautical Almanac, that are essential for the working of a sight of a heavenly body for line of position by the cosine-haversine formula, Marcq Saint Hilaire method).....	. 45
	General catalogue of charts and books published by the U. S. Hydrographic Office.....	. 50

Digitized by Google

REMITTANCE.

Orders for books or charts, when addressed to the Hydrographic Office, should be accompanied with Post-Office Money Order made payable to HYDROGRAPHIC OFFICE.

Prices are fixed, under the law, at the cost of printing and paper, and no reductions are made on orders for large quantities.

POSTAGE.—No additional charge is made for postage on addresses in the United States and possessions, nor on those in Canada, Cuba, Mexico, Panama, and Shanghai. For all other addresses postage is required at the usual rates for printed matter.

PERIODICAL PUBLICATIONS OF THE HYDROGRAPHIC OFFICE.

Pilot Charts, Notices to Mariners, Hydrographic Bulletins, and reprints are published by the United States Hydrographic Office, and are supplied free of cost to mariners of any nationality who cooperate by returning marine observations.

The following-named reprints of hydrographic information are obtainable at the United States Hydrographic Office, Washington, D. C., or at any of its branch offices:

No. 2.—North Atlantic Ice Movements.
No. 3.—Use of Oil to Calm the Sea.
No. 5.—Submarine Sound Signals. (Supply exhausted.)
No. 6.—Compass Work on the Great Lakes.
No. 8.—Questions and Answers.
No. 9.—The Origin and Mission of the Hydrographic Office.
No. 10.—The Use and Interpretation of Charts and Sailing Directions.
No. 11.—Production of Navigational Charts.
No. 13.—Cyclonic Storms.
No. 14.—Questions and Answers No. 2.
No. 21.—Questions and Answers No. 3.
No. 24.—North Atlantic Ice Patrols.
No. 25.—Questions and Answers No. 4.

BRANCH HYDROGRAPHIC OFFICES.

These offices are located as follows:

BOSTON.....Room 431, Board of Trade Building.
NEW YORK.....Rooms 301–302, Maritime Exchange, 78–80 Broad Street.
PHILADELPHIA.....Main Floor, The Bourse Building.
BALTIMORE.....Room 123, Customhouse.
NORFOLK.....Room 22, Customhouse.
SAVANNAH.....Second Floor, Customhouse.
NEW ORLEANS.....Room 319, Customhouse.
GALVESTON.....Rooms 401–402, City National Bank Building.
SAN FRANCISCO.....Merchants' Exchange.
PORTLAND, OREG.....Room 407, Customhouse.
SEATTLE.....Room 408, Lowman Building.
SAULT SAINTE MARIE.....Room 10, Federal Building.
DULUTH.....Room 1000, Torrey Building.
CLEVELAND.....Rooms 406–408, Federal Building
CHICAGO.....Room 528, Post Office Building.
BUFFALO.....Room 340, Post Office Building.

NOTE.—By authority of the Governor of the Panama Canal some of the duties of Branch Hydrographic Offices are performed by the Captain of the Port at Cristobal and the Captain of the Port at Balboa. A full set of reference charts and sailing directions may be consulted at these offices; and shipmasters may receive the Pilot Charts, Notice to Mariners, and Hydrographic Bulletin in return for marine and meteorological data reports. Observers' blanks and comparisons of navigational instruments may be obtained at the same time.

Digitized by Google

The Branch Offices do not sell any publications, but issue the Pilot Charts, Hydrographic Bulletins, Notices to Mariners, and reprints to cooperating observers.

They are supplied with the latest information and publications pertaining to navigation, and masters and officers of vessels are cordially invited to visit them, and consult freely officers in charge. Office hours, 9 a. m. to 4.30 p. m.

AGENTS FOR THE SALE OF HYDROGRAPHIC OFFICE PUBLICATIONS.

IN THE UNITED STATES AND ISLANDS.

ABERDEEN, WASH.—The Evans Drug Co.
BALBOA HEIGHTS, PANAMA.—Commmissary Department, Panama R. R. Co.
(Application should be made to the Captain of the Port at Cristobal or at Balboa.)
BALTIMORE, MD.—John E. Hand & Sons Co., 17 South Gay Street.
BOSTON, MASS.—Charles C. Hutchinson, 154 State Street.
W. E. Hadlock & Co., 132 State Street.
BUFFALO, N. Y.—Howard H. Baker & Co., 18–26 Terrace.
CHARLESTON, S. C.—Henry B. Kirk, 10 Broad Street.
CLEVELAND, OHIO.—Upson Walton Co., 1294–1310 West Eleventh Street.
CRISTOBAL, CANAL ZONE.—The Captain of the Port.
DULUTH, MINN.—Joseph Vanderyacht.
EASTPORT, ME.—Bucknam-Colwell Co., 48–50 Water Street.
GALVESTON, TEX.—Charles F. Trube, 2415 Market Street.
Purdy Brothers, 2217 Market Street.
GLOUCESTER, MASS.—Jeremiah Foster, 150 Main Street.
HONOLULU, HAWAII.—Hawaiian News Co.
JACKSONVILLE, FLA.—H. & W. B. Drew Co., 45 West Bay Street.
KETCHIKAN, ALASKA.—Ryus Drug Co.
KEY WEST, FLA.—Alfred Brost.
MANILA, PHILIPPINES.—Luzon Stevedoring Co.
MOBILE, ALA.—E. O. Zadek Jewelry Co.
NEW ORLEANS, LA.—Woodward, Wight & Co., Howard Avenue and Constance Street.
Rolf Seeberg Ship Chandlery Co., P. O. Box 541.
J. S. Sarenssen, 404 Canal Street.
NEWPORT NEWS, VA.—W. L. Shumate & Co., 133 Twenty-fifth Street.
NEW YORK, N. Y.—T. S. & J. D. Negus, 140 Water Street.
John Bliss & Co., 128 Front Street.
Michael Rupp & Co., 112 Broad Street.
R. Merrill's Sons, 66 South Street.
C. S. Hammond & Co., 30 Church Street.
NORFOLK, VA.—William Freeman, 304 Main Street.
PENSACOLA, FLA.—McKenzie Oerting & Co., 603 South Palafox Street.
PHILADELPHIA, PA.—Riggs & Bro., 310 Market Street.
John E. Hand & Sons Co., 224 Walnut Street.
PORTLAND, ME.—Wm. Senter & Co., 51 Exchange Street.
PORTLAND, OREG.—The J. K. Gill Co., Third and Alder Streets.
PORT TOWNSEND, WASH.—W. J. Fritz, 320 Water Street.
SAN DIEGO, CAL.—Arey-Jones Co., 933 Fourth Street.
SAN FRANCISCO, CAL.—Geo. E. Butler, Alaska Commercial Building, California and Sansum Streets.
Louis Weule Co., 6 California Street.
H. J. H. Lorenzen, 12 Market Street.
A. Lietz Co., 61 Post Street.
SAN JUAN, PORTO RICO.—Joseph A. Rose, Lighthouse Service.

Digitized by Google

SAN PEDRO, CAL.—Marine Hardware Co., 509 Beacon Street.
SAVANNAH, GA.—The Paulsen Company, 25 East Bay Street.
SEATTLE, WASH.—Lowman & Hanford Co., 616–620 First Avenue.
Max Kuner Co., 94 Columbia Street.
TACOMA, WASH.—Cole-Martin Co., 926 Pacific Avenue.
TAMPA, FLA.—Tampa Book & News Co., 513 Franklin Street.
WASHINGTON, D. C.—W. H. Lowdermilk & Co., 1424 F Street NW.
Wm. Ballantyne & Sons, 1409 F Street NW.
Brentanos, F and Twelfth Streets NW.
WILMINGTON, N. C.—Thos. F. Wood, 1–5 Princess Street.

IN FOREIGN COUNTRIES.

BELIZE, BRITISH HONDURAS.—A. E. Morlan.
BERLIN, GERMANY.—Dietrich Reimer, Wilhelmstrasse 29, SW. 48.
BUENOS AIRES, ARGENTINA.—Rodolfo Boesenberg, 824 Victoria Street.
CANSO, N. S.—A. N. Whitman & Son.
HABANA, CUBA.—Hillebrand y Mencio, 10 Mercaderes.
HALIFAX, N. S.—Creighton & Marshall, Ordnance Square.
HAMBERG, GERMANY.—Eckardt & Messtorff, Steinhöft I.
MANZANILLO, CUBA.—Enrique Lauten, Marti 44, Apartado 104.
MONTREAL, CANADA.—Harrison & Co., 53 Metcalfe Street.
PORT HAWKESBURY, C. B. I., N. S.—Alexander Bain.
QUEBEC, CANADA.—T. J. Moore & Co., 118–120 Mountain Hill.
ST. JOHN, N. B.—J. & A. McMillan, 98 Prince William Street.

Digitized by Google

Digitized by Google

Digitized by Google

Digitized by Google

Digitized by Google

Digitized by Google

Digitized by Google

This book should be returned to the Library on or before the last date stamped below.

A fine of five cents a day is incurred by retaining it beyond the specified time.

Please return promptly.

Digitized by Google

Digitized by Google